MULTIDIMENSIONAL ASSESSMENT OF PAIN RELATED DISABILITY AFTER SURGERY FOR CERVICAL DISC DISEASE

Abbott A1,2,3, Kjellman G1, Peolsson A1
1 Department of Medical and Health Sciences, Division of Physiotherapy, Faculty of Health Sciences, Linköping University, Sweden
2 Department of Physiotherapy, Karolinska University Hospital, Sweden
3 Department of Neurobiology, Care Sciences and Society (NVS), Division of Physiotherapy, Karolinska Institute, Sweden
4 Faculty of Health Science and Medicine, Bond University, Australia

Questions: Given only 25% of patients, 10 year post-surgery for cervical disc disease report clinically meaningful improvements in functional disability, what are the biopsychosocial factors associated with continued long-term disability? What are the implications for physiotherapy practice?

Design: Cross-sectional observational study.

Participants: Ninety patients who had undergone anterior disectomy and fusion (ACDF) surgery 10-13 years prior.

Outcome Measures: The Neck Disability Index (NDI), ACDF surgery type, surgical fusion status, patient age and Part 1 of the West Haven-Yale multidimensional pain inventory Swedish version (MPI-S) were entered into a statistical model. Part 1 of the MPI-S contains 5 subscales: pain severity, interference, life control, affective distress and support.

Results: Seventy-three patients answered the questionnaires. Non-linear categorical regression modeling (CA TREG) of the selected predictive variables explained 76.1% of the variance in NDI outcomes 10-13 years post ACDF. Of these predictors, MPI-S affective distress subscale (β = 0.635, p = <0.001) and pain severity subscale (β = 0.354, p = 0.001) were significant individual predictors of NDI ratings.

Conclusion: This is the first study to investigate potential factors associated with prolonged functional disability greater than 10 years post-surgery for cervical disc disease. The results suggest the importance of not only pain severity but also screening affective distress as a potential barrier to physical functioning in patients previously operated for cervical disc disease. Future research on the utility of affect-focused body awareness therapy and pain coping strategies for post-surgical patients with continuing pain and physical disability is indicated.

Key Practice Points:
• The screening of pain severity and affective distress is of importance for patients presenting with continuing physical disability after previous surgery for cervical disc disorders
• Affect-focused body awareness therapies and pain coping strategies may be a potential treatment alternative for patients with continuing pain and physical disability.

THE EFFECT OF PHYSIOTHERAPEUTIC REHABILITATION FOLLOWING LUMBAR TOTAL DISC

Green A1, Gilbert P1,2, Scott-Young M1, Abbott A1
1 Faculty of Health Science and Medicine, Bond University, Australia
2 Physiomax, Gold Coast, Australia
3 Gold Coast Spine, Gold Coast, Australia

Questions: What is the effect of physiotherapeutic rehabilitation post total disc replacement?

Design: Retrospective cohort study.

Participants: Six hundred patients who received lumbar disc replacement (TDR) or hybrid surgery (TDR + fusion) between 1997 and 2008.

Intervention: Group 1 received no post-surgical physiotherapy. Group 2 received one to three physiotherapy sessions. Group 3 received four or more physiotherapy sessions.

Outcome Measures: Oswestry Disability Index (ODI), Roland Morris Disability Questionnaire (RMO), Short Form-36 Physical (SF-36 PCS), Preoperative measures taken at baseline, and again at follow-up at 3, 6, 12 and 24 months postoperatively were audited.

Results: RMO demonstrated a significant better improvement in Group 3 compared to Group 1 after 3, 6, 12 and 24 months (p = 0.001, <0.001, 0.01 and 0.04, respectively), and for Group 2 compared to Group 1 after 3 and 6 months (p = 0.01 and 0.01, respectively). A significant better change in Group 3 compared to Group 1 was seen in the ODI after 3, 6 and 12 months (p = 0.007, p = 0.006 and 0.003, respectively). A significant better change in Group 2 compared to Group 1 was observed in the SF-36 PCS after 6 months (p = 0.01). A significant better change in Group 3 compared to Group 1 for SF-36 PCS at 6, 12 and 24 months (p = <0.001, 0.012 and 0.004, respectively) was observed.

Conclusion: Four or more sessions of post-operative physiotherapy demonstrated consistent statistically significant improvements in functional disability outcomes. However, these results were not considered clinically significant.

Key Practice Points:
• Four or more sessions of post-operative physiotherapy may improve functional disability outcomes in patients post TDR surgery.
• Prospective randomised controlled trials evaluating the effectiveness of specific physiotherapy interventions post-TDR surgery are indicated.

FACTORS EFFECTING PARTICIPATION RATES IN CHRONIC DISEASE SELF-MANAGEMENT PROGRAMMES

Daley M1, McDonald M1, Irwin J1, Abbott AD1
1 Faculty of Health Science and Medicine, Bond University, Australia
2 Ozcare, Robina, Australia

Question: What factors contribute to a lack of participation in community health care based Chronic Disease Self-Management (CDSM) programmes?

Design: Descriptive study.

Participants: Twenty two patients eligible to participate in a community health care based CDSM program and 17 general practitioners (GP).

Outcome Measures: A patient self-reported questionnaire was used to investigate expectations, potential facilitators and barriers to patient participation and GP referral to a CDSM program.

Results: For eligible CDSM participants, 57% were expecting relevant health maintenance advice, 18% expected improved general health and 25% were unsure what to expect. The main facilitators to participation were active recruitment by CDSM providers and that the program was cost free. Main barriers to participation included patient perceived relevance of the CDSM and scheduling issues. For GPs, a lack of awareness, uncertainty of referral pathway, their time constraints, and appropriateness for their client were the main barrier to referring to CDSM programs.

Conclusion: Clear information on CDSM program content and referral pathways directed at both potential participants and those who would refer participants should be greatly improved.

Key Practice Points:
• Community health CDSM providers should consider improving awareness of programs through marketing clear program content and referral pathways to potential patients directly and local health care professionals.

TOTAL DISC REHABILITATION FOLLOWING LUMBAR THE EFFECT OF PHYSIOTHERAPEUTIC REHABILITATION FOLLOWING LUMBAR TOTAL DISC
**FUNCTIONAL DECLINE AND QUALITY OF LIFE IN THE INPATIENT ONCOLOGY SETTING**

Imbesi S1, Murnane A2, Patchell S1, Columbe M2, Keogh J1, Abbott A1

1Faculty of Health Science and Medicine, Bond University, Australia
2Peter MacCallum Cancer Institute, Melbourne, Australia

**Question:** What effect does inpatient oncology treatment have on patient quality of life and physical functioning? Does recent weight loss associated with inferior physical functioning in patients admitted for inpatient oncology treatment? What are the implications for physiotherapy practice?

**Design:** Prospective observational cohort study.

**Participants:** Thirty-two patients receiving inpatient oncology treatment.

**Outcome Measures:** EORTC-30, SF8, Isometric muscle strength, 30 second arm curl, sit to stand and timed up and go.

**Results:** The EORTC-30 and SF-8 physical functioning and fatigue scales as well as timed up and go and sit to stand functional measures showed a trend of weekly decline in performance during inpatient oncology treatment but changes were not statistically different from baseline. Emotional and cognitive functioning and the 30 second arm curl however improved compared to baseline (p = <0.05). Social functioning showed a decline at two weeks compared to baseline (p = <0.05). Bivariate correlation analysis of baseline data showed sit to stand (r = -0.52), isometric knee extension (r = -0.39) and foot dorsiflexion (r = -0.42) strength to be significantly negatively associated with weight loss (p = <0.05).

**Conclusion:** Despite non-significant decline in physical functioning during inpatient oncology treatment, comparison to healthy aged matched normative values showed obvious inferiority in quality of life and physical functioning at time of admission to hospital.

**Key Practice Points:**
- Physiotherapy management of patients in the inpatient oncology setting should focus on preventing decline in physical and social functioning.
- Patients with greater reported weight loss may be more prone to larger declines in physical functioning in the inpatient oncology setting.

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**HEALTH-RELATED QUALITY OF LIFE AND HEALTH CARE UTILISATION AND COSTS IN SEVERE HIP AND KNEE JOINT DISEASE: A NATIONAL STUDY**

Ackerman IN1, Ademi Z2, Osborne RH2, Liew D3

1The University of Melbourne, Melbourne
2Deakin University, Melbourne
3Faculty of Health Science and Medicine, Bond University, Australia

**Biography:** Ilana is an experienced orthopaedic physiotherapist and Research Fellow based at the Melbourne EpICentre at The University of Melbourne. Her research program has built on her clinical interests surrounding the care of people with arthritis. She completed her PhD at The University of Melbourne in 2006 and currently holds an NHMRC Public Health Early Career Fellowship to support her research into the burden of severe hip and knee osteoarthritis in Australia and equitable access to treatment.

**Questions:** What is the Health-Related Quality of Life (HRQoL) experienced by people with severe hip and knee joint disease (defined as arthritis or osteoarthritis)? How do health care utilisation and costs vary according to severity of hip and knee joint disease?

**Design:** National cross-sectional, population-based study.

**Participants:** People aged ≥39 years randomly selected from the Australian electoral roll (n=1157). Of these, 237 (20%) reported hip and/or knee joint disease.

**Outcome Measures:** Joint disease severity was classified using Western Ontario and McMaster Universities Osteoarthritis (WOMAC) Index scores: 0-7=asymptomatic, 7-38=mild-moderate, 39-100=severe. HRQoL was evaluated using the Assessment of Quality of Life (AQoL) instrument (range = -0.04-1.00; scored worst-best).

**Results:** People with severe joint disease had extremely low HRQoL (adjusted mean AQoL 0.43, 95%CI 0.38-0.47), compared to the mild-moderate (adjusted mean 0.72, 95%CI 0.69-0.75) and asymptomatic groups (adjusted mean 0.80, 95%CI 0.74-0.86). Use of medical care and related costs were highest for the severe group (mean total costs for previous month $53.22, $12.76 and $10.37 for severe, mild-moderate and asymptomatic groups, respectively; p<0.01). Physiotherapy services were used infrequently by the mild-moderate (11%) and severe groups (10%).

**Conclusion:** These national data provide new evidence of the personal and economic burden of hip and knee joint disease in Australia. Severe joint disease was associated with very poor HRQoL and there was a clear relationship between increasing severity and higher medical care utilisation and costs.

**Key Practice Points:**
- Severe hip and knee joint disease was associated with a marked reduction in Health-Related Quality of Life
- Greater joint disease severity was associated with higher medical care utilisation and related costs
- A program to promote the potential benefits of physiotherapy to patients, GPs and medical specialists may be warranted
NEW EVIDENCE OF TRUNK AND PELVIC DEVIATIONS DURING GAIT IN CHILDREN WITH HEREDITARY SPASTIC PARAPLEGIA

Adair B1, ROODA J1, McGINLEY J1, MORRIS ME2
1Department of Physiotherapy, University of Melbourne, Carlton
2Hugh Williamson Gait Laboratory, Royal Children’s Hospital, Parkville

Questions: What kinematic gait deviations are exhibited at the trunk, pelvis and hips in children with hereditary spastic paraplegia (HSP)?

Design: Prospective, observational design.

Participants: Eleven children with HSP who were able to walk without assistive devices for short distances whilst performing three-dimensional gait analysis.

Outcome Measures: Kinematic gait deficits were recorded using three-dimensional gait analysis. Gait Variable Scores were calculated to determine the magnitude of kinematic deviation across the gait cycle when compared with the gait patterns of unimpaired children from a reference group. Discrete gait variables were used to determine the direction and timing of specific deviations.

Results: Gait Variable Scores were significantly higher for the movements of the trunk, pelvis and hips in the sagittal and coronal planes (p = .010–.029). In particular, the amplitudes and ranges of movement were significantly larger for the trunk and pelvis in the sagittal and coronal planes (p < .001–.011). The timing of peak pelvic obliquity was noted to be later in the gait cycle (p = .002). Minimal differences were found for these segments in the transverse plane.

Conclusion: This is one of the first studies to examine the gait kinematics at the trunk and pelvis in the coronal and transverse planes in children with HSP. Large deviations were particularly noted at these segments in the sagittal and coronal planes. Further research is warranted to determine causative factors and describe the trunk and pelvic movements in children with more severe forms of the disorder.

Key Practice Points:
• Kinematics at the trunk and pelvis are affected in children with HSP.
• Increased movement at these segments may help to compensate for distal deficits such as difficulties stepping.
• Further research is needed to confirm the causative factors of gait deviations in HSP.

DOES THE PHYSIOTHERAPY-LED NEUROSURGERY ACCESS SERVICE (NAS) IMPROVE EFFICIENCY IN THE NEUROSURGICAL CLINIC?

Aitken L, Schoch P, Hakkenes S, Exton M

Question: Does the physiotherapy-led Neurosurgery Access Service (NAS) improve efficiency in the neurosurgical clinic?

Design: Quasi-experimental study with historical control group.

Participants: Patients presenting to Neurosurgery clinic in 2009 (pre-NAS) and 2012 (post-NAS)

Intervention: The NAS was established in 2010 to manage demand for neurosurgical services within Barwon Health. The service includes a consultant clinic, and physiotherapy-led screening clinics to establish if clients require surgical consultation or conservative management. NAS physiotherapists are also responsible for triaging referrals. The NAS is unique because it has two options to access the surgical clinic: the patient can be scheduled for individual consultation with the surgeon; or the case can be presented by the physiotherapist to the surgeon without the patient present.

Trial registration: ACTRN1261000533099

Outcome Measures: Number of patients managed per clinic; Percentage of patients deemed appropriate for surgery; Number of patients discharged post case review; Adverse Events.

Results: The neurosurgical service manages significantly more patients than in 2009 (16.8 patients compared with 6.36 patients per clinic). Median number of patients seen per surgeon clinic increased from 6 (pre-NAS) to 6.5 per week (post-NAS) (p = 0.001). Conversion to surgery rate increased from 15% (pre-NAS) to 29% (Post NAS). One third of case review patients are discharged, without attending a consultant appointment. There have been no adverse events.

Conclusion: The introduction of the NAS and case-review process has significantly increased efficiency in the neurosurgical service. Physiotherapists can safely triage referrals, screen patients and identify the neurosurgical cohort.

Key Practice Points:
• Physiotherapy-led neurosurgical access clinics contribute to safe patient care and significantly improved efficiency in consultant neurosurgical clinics.
• Physiotherapists can safely triage neurosurgical referrals.
• Physiotherapists can safely identify the neurosurgical cohort.
• The case review process improves throughput and efficiency in the surgical clinics.

PHYSIOTHERAPIST-DELIVERED EXERCISE AND PAIN COPING SKILLS TRAINING IS MORE EFFECTIVE THAN EITHER INTERVENTION ALONE IN KNEE OSTEOARTHRITIS

Ahamed Y1, Bennett K1, Bryant C1, Jull G1, Hunt M1, Kenardy J1, Forbes A4, Akram M6, Nicholas M7, Metcalf B1, Francis Keefe F8
1Centre For Health, Exercise & Sports Medicine, Department Of Physiotherapy, University Of Melbourne, Melbourne, VIC, Australia
2Psychological Sciences, University of Melbourne, and Centre for Women & 45B23’s Mental Health, Royal Women’s Hospital, Melbourne, VIC, Australia
3Centre of Clinical Research Excellence in Spinal Pain, Injury & Health, School of Health and Rehabilitation Sciences, University of Queensland, Brisbane, Qld, Australia
4Department of Physical Therapy, University of British Columbia, Vancouver, BC, Canada
5Centre of National Research on Disability and Rehabilitation Medicine, School of Psychology and Medicine, University of Queensland, Brisbane, Qld, Australia
6Department of Epidemiology and Preventative Medicine, School of Public Health and Preventative Medicine, Monash University, Melbourne, VIC, Australia
7Pain Management and Research Centre, University of Sydney, Sydney, NSW, Australia
8Department of Psychiatry and Behavioral Sciences, Duke University School of Medicine, Durham, NC, USA

Trial registration: Involves physiotherapists for knee OA.

Outcome Measures: This study provides strong evidence of the benefits of an integrated exercise and PCST program for physical function and a range of functional and psychological outcomes. This highlights the potential for a new model of care involving physiotherapists for knee OA.

Trial registration: ACTRN1261000533099
**COMMUNICATION IN INDIGENOUS HEALTHCARE: EXTENDING THE DISCOURSE INTO THE PHYSIOTHERAPY DOMAIN**

Vanessa Alford  
PhD student, Physiotherapy, The University of Melbourne

Meaningful communication is important in any interaction between the physiotherapist and client. Ineffective communication between Indigenous people and non-Indigenous health professionals has been documented in the literature; however, very little relates to the physiotherapy discipline. The intention of this discourse is to provide physiotherapists with an insight into the literature on communication in Indigenous healthcare in Australia to start building an evidence base for future research in this area of practice. Lack of understanding and respect towards Indigenous culture and beliefs provides a major barrier to effective communication in Indigenous healthcare and has a profound impact on the clinical interaction and healthcare provided to Indigenous Australians. Indigenous culture is not homogeneous so there is not one set recipe for communicating with Indigenous people. However, health professionals must acknowledge the culture the person brings to the consultation and respect how they conceptualise their health experience. Equally important is for health professionals to critically self-reflect on their own cultural beliefs, values and assumptions and how they impact on the clinical interaction.

**THE EFFECT OF SHIATSU ON THE ACUTE LOW BACK PAIN**

Ghadeer Al-Mukharag, Bushra Al-Galaf, Fatimah Al-Baharna, Sahari Al-Dubaisy

**Introduction:** Low Back Pain (LBP) is one of the most common disorders and leading cause of disability nowadays. Most cases of the LBP are due to non-specific causes, and only few are due to definite pathology. Shiatsu is an evolving treatment method which involves applying pressure on certain points distributed throughout the body, each to treat a certain disorder or disease. This study was conducted to test the effect of Shiatsu in the treatment of acute LBP.

**Subjects:** A sample of convenience (n=12) of King Saud University female students were examined in this study, ranging in age between 20-23 years (mean=22.5, SD=0.65). Subjects were screened to ensure no history of chronic LBP or pulmonary disease (COPD). This study was conducted to test the effect of Shiatsu in the treatment of acute LBP.

**Methods:** Each subject answered a Visual Analogue Scale (VAS) and did the Leaning Forward Flexion Test (LFFT) before and after treatment. For Shiatsu treatment, subjects were asked to apply pressure on a chosen point in the palm of the hand. The whole treatment session took around five minutes, but the pressure applied had been just three minutes, with both hands.

**Results:** Using paired t-test to analyze our data, we found a significant difference between the pre- and post-treatment scores of the two tests used in the experiment (VAS and LFFT) with (p<0.001), pre-treatment mean (X=28.96) and post-treatment mean (X=19.00).

**Discussion and Conclusion:** Our findings support our hypothesis that LFFT and VAS scores demonstrate a significant reduction after applying the Shiatsu. The limitations in our study include a) a small sample size, and b) lack of standardization to the therapist who applied the treatment.
KNEE FLEXOR AND EXTENSOR TORQUE 6 MONTHS FOLLOWING UNILATERAL TOTAL KNEE REPLACEMENT

Alnagmoosh AA, Fransen M, Harmer AR
The University of Sydney, Sydney

Questions: Are there significant differences for knee flexor and extensor torques between the operated and non-operated knee six months after unilateral total knee replacement (TKR)?

Design: Prospective observational study.

Participants: To date, twenty three participants (13 men/ 10 women, age range 45-75 yr) who had undergone unilateral TKR.

Outcome Measures: Knee extensor and flexor torques (Nm) were measured on both the operated and non-operated legs using the Biodex System 2 Dynamometer (Biodex Corporation, Shirley NY, USA.). Torque was measured isometrically (0°/sec) at 60° knee flexion: and isokinetically at 60°/sec and 135°/sec through an arc of approximately 90°. Participants performed three trials at each speed. The highest torque of the three trials was used.

Results: Torque was significantly higher in the non-operated than the operated leg (131 ± 4.2 Nm, mean difference ± SE) and higher with extension than flexion (p<0.001). Isometric knee extension (KE) torque was significantly lower in the operated leg (120 ± 8 Nm) than the non-operated leg (141 ± 8 Nm; p<0.05). Isokinetic KE torque was lower in the operated leg (60°/s: 89 ± 7 Nm; 135°/s: 68 ± 5 Nm) than the non-operated leg (60°/s: 114 ± 8 Nm; 135°/s: 85 ± 6 Nm; p<0.05). Knee flexor (KF) torque did not differ between the operated and non-operated knee.

Conclusion: The data collected to date show that isometric and isokinetic knee extension in the operated leg is still weaker than that in the non-operated leg six months post-surgery. However, knee flexion torque was similar between operated and non-operated knees.

Key Practice Points:
• Knee extension torque does not return to the same level as non-operated side six months after unilateral total knee replacement.
• Physiotherapist should focus on regaining knee extensor strength at varying speeds of muscle contraction after knee replacement.

INSTITUTE: Arthritis and Musculoskeletal Research Group, Discipline of Physiotherapy, Faculty of Health Sciences, The University of Sydney.

We are currently gathering data on pain and function, muscle strength, gait, and activity levels (accelerometry) from patients who underwent total knee replacement six months previously. Extracts from the muscle strength data are presented in this abstract.

OUTCOMES OF A MULTIDISCIPLINARY REHABILITATION PROGRAM FOR CHILDREN AND ADOLESCENTS WITH CHRONIC FATIGUE SYNDROME

Apple A1, Harvey A1,2
1The Royal Children's Hospital, Melbourne
2Murdock Children's Research Institute, Melbourne

Questions: Does an intensive burst of physiotherapy within a multidisciplinary program improve the physical capacity of children and adolescents with Chronic Fatigue Syndrome? Do they gain greater control and predictability and become more engaged in their life?

Design: Prospective observational study.

Participants: Twenty children and adolescents aged 10-18 years engaging in a multidisciplinary rehabilitation program involving 4 weeks of inpatient or outpatient intensive education and physiotherapy input followed by ongoing support over 12 months. The principal aim of the program was to enable participants to manage their condition by learning strategies within a cognitive behavioral therapy (CBT) framework.

Outcome Measures: Measures included: time walked on a treadmill at 5km per hour with increasing inclination, heart rate, perceived exertion (Borg scale), whole body strength (number of seconds held in plank position), school attendance (days per week), Beck’s youth depression inventory and the Canadian Occupational Performance Measure. These were measured at initial assessment, at the completion of the four week intensive program plus at 1, 3, 6 and 12 months post program.

Results: Preliminary results to date have been positive. The Canadian Occupational Performance Measure showed a clinically significant increase in both performance and satisfaction scores (Performance =2.455 Satisfaction 3.335) . Time walked on the treadmill as well as time held in plank position doubled in the weeks following the commencement of the intensive program.

Conclusions: Children and adolescents with chronic fatigue syndrome are able to improve their function and reintegration into previously enjoyed activities including school attendance following an intensive multidisciplinary program.

Key practice points:
• Physiotherapy input is a vital component in the multidisciplinary management of children and adolescents with Chronic Fatigue Syndrome.
• Children and adolescents can re engage in key life areas when taught self management principles.
• Ongoing support is essential for longer term success in the management of this chronic condition.

DOES LOW LEVEL LASER THERAPY REDUCE PAIN FROM CRACKED OR GRAZED NIPPLES IN BREASTFEEDING WESTERN AUSTRALIAN WOMEN?

Affiliation: Curtin University, Perth

Question: Does the addition of low level laser therapy to standard care reduce pain from cracked or grazed nipples associated with breastfeeding related nipple trauma?

Design: Randomised placebo-controlled trial.

Participants: Twenty-two subjects recruited from women with breastfeeding related nipple trauma.

Intervention: Ten received active treatment and twelve placebo. A class 3B single GaAlAs laser diode or identical placebo applicator were used to provide treatment at 3cm², 100% per point in a grid pattern. Pain was assessed before and after treatment. Follow up calls were made at two and eight weeks to assess breastfeeding continuance.

Outcome Measures: Numerical rating pain scale.

Results: On first treatment median (interquartile range) pain reduced from 3.00(4.5) to 0.50(1.0) (p=0.003) in the placebo group compared to 4.00 (3.25) to 2.50 (2.25) (p=0.006) in the active group. The change was significantly greater for the placebo group (p=0.025). There was a trend towards continued breastfeeding in the active group at 8 week follow up (p=0.09). Outliers, placebo effect, therapist bias and possible effect of blue light phototherapy may have influenced results. Inadequate power was reached, due to time restraints for data collection of student project.

Conclusion: Laser has not been shown to be more effective than placebo in this study. There are no reasons to cease using laser until more definitive research is available. This study has provided good quality pilot data from which power can be calculated for a definitive randomised control trial.

Key Practice Points:
• There is no evidence to suggest that laser treatment for cracked or grazed nipples should be discontinued
• Further research on the potential benefits of laser and blue light phototherapy in the treatment of cracked or grazed nipples needs to be undertaken
• This study provides pilot data from which power can be calculated for a definitive trial
CAN ACUPUNCTURE TREATMENT AFFECT ACUTE INFLAMMATION?

Ashton, Hamish
Private Practitioner

**Question:** Can acupuncture treatment affect acute inflammation?

**Design:** Critical Review of available research.

**Participants:** Animals (rats and mice) were used as subjects in experimental research trials.

**Intervention:** The research subjects were grouped into different conditions and control groups to assess the effects of various treatment parameters on an acute inflammatory model.

**Outcome Measures:** Physiological measures of inflammation were measured to assess the effect of acupuncture treatment on acute inflammatory models.

**Results:** Both pre-treatment and immediate treatment after the initiation of an acute inflammatory model demonstrated a reduction in inflammatory markers. Multiple treatment conditions using both manual and electro-acupuncture at varying sites were shown to have an effect.

**Conclusion:** Using animal subjects and an acute inflammatory model, acupuncture has been shown to reduce the quantity of inflammation and inflammatory mediators. Animal models can be used to test various parameters of treatment application to assess best outcome. In assessing experimental research using animals different criteria need to be used to identify quality of articles. Questions remain on the transference of animal data to the human population.

**Key Practice Points:**
- Pre-treatment of acupuncture can reduce the inflammatory response of an inflammatory insult
- Immediate treatment of acupuncture following an inflammatory insult can significantly reduce the inflammatory response.
- Various treatment parameters have shown to be effective which allows individualisation of treatment to clinical subjects

TRANSLATING STRENGTH TO FUNCTION IN SURVIVORS OF A CRITICAL ILLNESS: AN OBSERVATIONAL INVESTIGATION OF DYNAMOMETRY, MOBILITY AND DISCHARGE DESTINATION

Baldwin CE1,2, Paratz JD3
1 University of South Australia, Adelaide
2 Flinders Medical Centre, Adelaide
3 University of Queensland, Brisbane

**Question:** In survivors of sepsis and mechanical ventilation, are there associations between muscle strength/force timing, functional mobility at intensive care unit (ICU) discharge and hospital discharge destination?

**Design:** Secondary analysis of a prospective observational study.

**Participants:** Sixteen previously independent patients with sepsis who required ≥ five days of mechanical ventilation.

**Outcome Measures:** Volitional hand grip and knee extension strength by portable dynamometry during ICU admission (including time to peak knee extension force); Mobility by the physical function ICU test (PFIT) and De Morton Mobility Index (DEMMI) at ICU discharge.

**Results:** Grip strength was associated with both PFIT (r = 0.604, p = 0.005) and DEMMI scores (r = 0.512, p = 0.03) at ICU discharge, as was knee extension strength (PFIT: r = 0.565, p = 0.02, DEMMI: r = 0.725, p < 0.001). Patients generated their peak knee extension force later than matched healthy controls (mean difference 0.514 (95% CI 0.205 to 0.824) seconds, p < 0.001), with peak force time, not force itself, correlated with the level of assistance required for a sit to stand transfer (rated as 0, 1, 2, or unable) (rho = 0.648, p = 0.009). Survivors (n = 14) who were discharged home had greater grip strength than those discharged to rehabilitation or another hospital (p = 0.01).

**Conclusion:** Muscle strength has rarely been measured in conjunction with functional mobility in ICU survivors. This analysis provides a basis for investigating a wider range of neuromuscular impairments that may contribute to reduced physical function.

**Key Practice Points:**
- ICU survivors may have impaired coordination and weakness that impacts functional mobility.
- Patients with delayed force timing are likely to require more assistance to transfer from sit to stand.
- Grip strength may not just be associated with hospital mortality (AJRCCM 2008;178:261), but be related to discharge destination.

IS ULTRASOUND A RELIABLE MEASURE OF STERNAL MICROMOTION DURING FUNCTIONAL TASKS IN PATIENTS FOLLOWING CARDIAC SURGERY?

Balachandran S1, Lee A1, O’Reilly M2, Royse A3, Denehy L3, El-Ansary D4
1 Physiotherapy Department, The University of Melbourne, Level 7, Alan Gilbert Building, 166 Barry Street, Parkville
2 Physiotherapy Department, Royal Melbourne Hospital, Grattan Street, Parkville
3 Department of Surgery, Royal Melbourne Hospital, Grattan Street, Parkville

**Question:** Is real-time ultrasound a reliable measure of sternal micromotion during functional tasks in acute patients following cardiac surgery via a median sternotomy?

**Design:** Prospective, observational study.

**Participants:** Twenty participants who had undergone cardiac surgery via a median sternotomy.

**Outcome Measures:** Ultrasound imaging of the sternum was undertaken at rest and during five functional tasks including, deep inspiration, cough, upper limb elevation (unilateral and bilateral) and sit to stand. Each task was repeated three times, and the order was randomized. The ultrasound images were captured using a Sonosite M-Turbo device, three to seven days following surgery.

**Results:** Grip strength was associated with both PFIT (r = 0.604, p = 0.005) and DEMMI scores (r = 0.512, p = 0.03) at ICU discharge, as was knee extension strength (PFIT: r = 0.565, p = 0.02, DEMMI: r = 0.725, p < 0.001). Patients generated their peak knee extension force later than matched healthy controls (mean difference 0.514 (95% CI 0.205 to 0.824) seconds, p < 0.001), with peak force time, not force itself, correlated with the level of assistance required for a sit to stand transfer (rated as 0, 1, 2, or unable) (rho = 0.648, p = 0.009). Survivors (n = 14) who were discharged home had greater grip strength than those discharged to rehabilitation or another hospital (p = 0.01).

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- ICU survivors may have impaired coordination and weakness that impacts functional mobility.
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- Grip strength may not just be associated with hospital mortality (AJRCCM 2008;178:261), but be related to discharge destination.

**Outcome Measures:**
- Physiological measures of inflammation were measured to assess the effect of acupuncture treatment on acute inflammatory models.

**Results:** Both pre-treatment and immediate treatment after the initiation of an acute inflammatory model demonstrated a reduction in inflammatory markers. Multiple treatment conditions using both manual and electro-acupuncture at varying sites were shown to have an effect.

**Conclusion:** Using animal subjects and an acute inflammatory model, acupuncture has been shown to reduce the quantity of inflammation and inflammatory mediators. Animal models can be used to test various parameters of treatment application to assess best outcome. In assessing experimental research using animals different criteria need to be used to identify quality of articles. Questions remain on the transference of animal data to the human population.

**Key Practice Points:**
- Pre-treatment of acupuncture can reduce the inflammatory response of an inflammatory insult
- Immediate treatment of acupuncture following an inflammatory insult can significantly reduce the inflammatory response.
- Various treatment parameters have shown to be effective which allows individualisation of treatment to clinical subjects

**Outcome Measures:**
- Physiological measures of inflammation were measured to assess the effect of acupuncture treatment on acute inflammatory models.

**Results:** Both pre-treatment and immediate treatment after the initiation of an acute inflammatory model demonstrated a reduction in inflammatory markers. Multiple treatment conditions using both manual and electro-acupuncture at varying sites were shown to have an effect.

**Conclusion:** Using animal subjects and an acute inflammatory model, acupuncture has been shown to reduce the quantity of inflammation and inflammatory mediators. Animal models can be used to test various parameters of treatment application to assess best outcome. In assessing experimental research using animals different criteria need to be used to identify quality of articles. Questions remain on the transference of animal data to the human population.

**Key Practice Points:**
- Pre-treatment of acupuncture can reduce the inflammatory response of an inflammatory insult
- Immediate treatment of acupuncture following an inflammatory insult can significantly reduce the inflammatory response.
- Various treatment parameters have shown to be effective which allows individualisation of treatment to clinical subjects

**Outcome Measures:**
- Physiological measures of inflammation were measured to assess the effect of acupuncture treatment on acute inflammatory models.

**Results:** Both pre-treatment and immediate treatment after the initiation of an acute inflammatory model demonstrated a reduction in inflammatory markers. Multiple treatment conditions using both manual and electro-acupuncture at varying sites were shown to have an effect.

**Conclusion:** Using animal subjects and an acute inflammatory model, acupuncture has been shown to reduce the quantity of inflammation and inflammatory mediators. Animal models can be used to test various parameters of treatment application to assess best outcome. In assessing experimental research using animals different criteria need to be used to identify quality of articles. Questions remain on the transference of animal data to the human population.

**Key Practice Points:**
- Pre-treatment of acupuncture can reduce the inflammatory response of an inflammatory insult
- Immediate treatment of acupuncture following an inflammatory insult can significantly reduce the inflammatory response.
- Various treatment parameters have shown to be effective which allows individualisation of treatment to clinical subjects
MEASURING OUTCOMES IN THE ACUTE SETTING

Baldwin CE1,2
1University of South Australia, Adelaide
2Flinders Medical Centre, Adelaide

Outcome measurement is a key component of evidence-based practice for physiotherapists, perhaps most commonly applied to the monitoring, evaluation and determination of modifications to interventions. To support the implementation of such practices, physiotherapists require access to standardised outcome measures, knowledge of their psychometric properties and skills in their administration. However, challenges to this in the acute setting may include the heterogeneity of clinical populations and the availability of sufficiently valid and reliable measures that can be applied across the spectrum of disability, from acute to community settings. Still, the International Classification of Functioning, Disability and Health (ICF) provides a versatile and multi-dimensional framework upon which outcome measurement can be conceptualised at individual, institutional and social levels. At the individual level, physiotherapists may quantify impairments or diagnose muscle weakness with the MRC-sum score or hand grip force; physical function or mobility may be assessed with various measures of activities of daily living, with more specific tools such as the physical function ICU test (PFIT), walk tests, or the ICU mobility scale (IMS) able to be used for targeted exercise prescription in the critically ill. The application of the ICF in acute care also encapsulates health related quality of life measurement and economic and health service use evaluations. Furthermore, physiotherapists should be aware of the value of not just measuring patient-centric outcomes, but those related to process, be they safety monitoring systems or compliance with clinical guidelines, with process measures being a more direct indicator of health care quality.

EARLY PELVIC FLOOR MOTOR CONTROL TRAINING UTILISING RTUS FOR BIOFEEDBACK IN MEN WITH PROSTATE CANCER - A NEW PROTOCOL

Baptist

Aim: To determine whether exercises using real-time ultrasound (RTUS) guidance to develop pelvic floor motor control are better when delivered pre- or post-operatively for men with prostate cancer.

Methods:
Participants: 91 men diagnosed with prostate cancer.

Intervention: Low MVC pelvic floor motor control exercises were taught to men with prostate cancer by an experienced physiotherapist, to learn to isolate pelvic floor contractions. The initial session to learn this skill was conducted either pre- or post-operatively. Motor training utilising RTUS for biofeedback. Physiotherapy sessions were continued until the skill had been achieved or 8 physiotherapy sessions completed.

Outcome Measures: Skill attainment was defined by a newly formulated protocol based on visible changes on the RTUS screen. Time to skill acquisition was recorded.

Results: Significantly more patients who were initially seen pre-operatively acquired the skill of pelvic floor control compared with patients initially seen post-operatively (OR 11.87 95%CI 1.4 to 99.5 p = 0.02). For patients who acquired the skill, time to acquire was similar, with mean time for those seen pre-operatively 10.0 minutes (SD 8.3), and 11.9 minutes (SD11.8) for those seen post-operatively (p=0.36). Logistic regression analysis conducted to identify predictors of successful skill attainment found BMI score and pre- or post-operative attendance accounted for 46.3% of the variance in pelvic floor control attainment.

Conclusions: Rate of attainment of pelvic floor control in men with prostate cancer is enhanced by pre-operative physiotherapy sessions for training pelvic floor muscle control.

PILATES EXERCISE FOR IMPROVING BALANCE AND DECREASING FALLS RISK

Barker A1, Bird M-L1, Rose G2
1Monash University, Melbourne, 2 University of Tasmania, Launceston, 3 Monash University, Melbourne

Question: Is Pilates exercise effective for improving balance and decreasing falls risk and do the Pilates exercise protocols tested meet the best-practice recommendations for falls prevention?

Design: Systematic review of the literature.

Participants: Healthy adults.

Intervention: Pilates exercise including mat and equipment based programs.

Outcome Measures: Balance and/or fall rates. Data Extraction: The Physiotherapy Evidence Database (PEDro) scale was used to assess the study quality. The reviewers assessed whether the Pilates exercises tested met the current best-practice recommendations for falls prevention: 1. Exercises provide a moderate to high challenge to balance; and 2. Programs were of sufficient dose (>2 hours per week and >50 hours over the trial period).

Results: Eleven studies, including six RCTs, met the inclusion criteria. PEDro scale values for the RCTs ranged from 3 to 7 indicating a low to moderate methodological quality. Of the studies that included sufficient detail to enable assessment of compliance with best-practice falls prevention recommendations, two did not include any exercises that provided a moderate to high challenge to balance and six included between 5-50% that met this criterion. Nine of the 11 studies met the criteria of providing ≥2 hours of exercise per week, but none provided >50 hours of exercise during the trial. Seven of the 11 studies observed a positive impact on balance whilst the remaining four observed no change. The single RCT that did report on falls observed a positive impact on falls.

Conclusion: There is limited evidence to support the effectiveness of Pilates for improving balance and decreasing falls risk.

Key Practice Points:
- Past systematic reviews on exercise to improve balance and decrease falls risk provide clear recommendations about the specific characteristics of these exercise programs.
- Pilates interventions in both future trials and clinical practice, which aim to improve balance and reduce falls should be designed to comply with these best-practice guidelines.
- There is need for future research in this area as the current findings likely reflect the low quality of included studies, poor specificity of exercises prescribed and a low dosage of exercises prescribed.

THE BENEFITS OF AQUATIC EXERCISE FOR PEOPLE WITH ARTHRITIS AND OTHER MUSCULOSKELETAL CONDITIONS: A SYSTEMATIC REVIEW WITH META-ANALYSIS

Barker A1, Talevski J1, Morello R1, Nolan G2, Eastham C2, and de Silva R2
1Health Services Research Unit, Division of Health Services and Global Health Research
Department of Epidemiology & Preventive Medicine, School of Public Health and Preventive Medicine, Monash University, Melbourne
2Arthritis Victoria, Melbourne

Question: Is aquatic exercise beneficial for people with arthritis or other musculoskeletal conditions?

Design: Systematic review with meta-analysis of randomised controlled trials (RCTs).

Participants: Adults (>18 years) with osteoarthritis, rheumatoid arthritis, ankylosing spondylitis, low back pain, fibromyalgia, osteoporosis, gout, polymyositis or psoriatic arthritis.

Intervention: Endurance, strength, resistance or aerobic exercise conducted in warm water.

Outcome Measures: Objective measures of pain, quality of life, joint stiffness or muscle strength.
THE INFLUENCE OF A SHORT MESSAGE SERVICE APPOINTMENT REMINDER SYSTEM ON FAILURE TO ATTEND RATES IN AN OUTPATIENT PHYSIOTHERAPY DEPARTMENT

**Barnett C, Henderson JM, Haskins R**
Royal Newcastle Centre, Newcastle

**Question:** What is the influence of a short message service appointment reminder system on failure to attend rates in a large public hospital physiotherapy outpatient department?

**Design:** Observational study with non-concurrent control.

**Intervention:** The one-year experimental phase involved sending a short message service appointment reminder to all patients with a hospital-registered mobile phone number one day prior to their scheduled physiotherapy outpatient appointment. During the one-year control period no reminder was sent to patients.

**Outcome Measures:** Proportion of failed to attend appointment outcomes.

**Results:** 21,830 individual appointments were recorded across the two-year study period. New patients were less likely to fail to attend compared to those scheduled for reassessment (7.5% vs 10.3%, OR = 0.25, 95% CI 0.21 to 0.28). Strength gains were greater in land-based compared to aquatic exercise (SM 0.54, 95% CI 0.10 to 0.95).

**Conclusion:** Aquatic exercise has beneficial effects for people with arthritis and other musculoskeletal conditions in terms of pain, stiffness, strength and quality of life. Benefits are comparable to those achieved with land based exercise except for strength, which appeared improve more with land-based programs.

Key Practice Points:
- Aquatic exercise interventions can provide pain relief and improve health-related quality of life in patients with arthritis or other musculoskeletal conditions.
- Aquatic exercise programs are more likely to be effective if continued for a long period of time.
- Aquatic therapy interventions of short duration are unlikely to have beneficial effects on pain, physical function or quality of life.

**THE START BACK SCREENING TOOL IN AN AUSTRALIAN PHYSIOTHERAPY OUTPATIENT SETTING: DISTRIBUTION OF RISK CLASSIFICATION AND THREE MONTH OUTCOMES**

**Barnett C, Henderson JM, Haskins R**
Royal Newcastle Centre, Newcastle

**Questions:** What is the distribution of STarT back screening tool risk classification in patients with low back pain attending an outpatient physiotherapy department in NSW Australia? What are the three month outcomes of this patient group stratified by baseline risk classification?

**Design:** Prospective case series.

**Participants:** One hundred and twenty consecutive patients with low back pain referred from general practice attending an outpatient physiotherapy service.

**Outcome Measures:** Baseline STarT back screening tool risk classification and three month follow-up global perceived effect (11 point scale, -5 to +5).

**Results:** Included patients were predominantly female (63%) with a mean age of 51 years (SD 18), and had low back pain that was predominantly categorised as non-specific (85%) and of greater than three months duration (74%). At the baseline assessment 36 (30%) patients were classified as low risk, 41 (34%) medium risk and 43 (36%) high risk. Three month follow-up data was available for 49 (41%) participants. Global perceived effect at three months was 0.8 (SD 1.9) for those classified as low risk at the baseline assessment, 2.4 (SD 1.4) for those classified as medium risk, and 1.6 (SD 2.4) for those classified as high risk. No statistically significant difference in three month global perceived effect outcomes was identified across the three risk classifications (p = 0.36).

**Conclusion:** The study data provides preliminary evidence that patients classified by the STarT back screening tool as low risk may not achieve clinically favourable three month outcomes as anticipated in an Australian outpatient physiotherapy context.

Key Practice Points:
- A larger proportion of high risk patients were identified in this study than previously reported in other clinical settings.
- Contrary to expectation, low risk patients did not achieve relatively favourable three month outcomes.
- More research into the STarT back screening tool is required in an Australian outpatient physiotherapy setting.

**REFLECTIVE AND EFFECTIVE: THEORY, TOOLS AND EXPERIENCES TO SUPPORT LEARNER PHYSIOTHERAPISTS**

**Barradell S, Jones LE**
La Trobe University, Melbourne

**Introduction/background:** Evidence from educational research supports the development of reflective skills for effective learning. Reflection on performance is essential in professional practice. The Australian Standards for Physiotherapy promote reflection with physiotherapists required to ‘undertake reflective practice and self analysis of professional abilities’. At La Trobe University, reflective skills are enhanced in learner physiotherapists through engagement with authentic tasks, which demand critical analysis of knowledge, skills, attitudes and decision making. These assessment tasks are designed to promote a deeper level of reflection by enabling exploration of knowledge and feelings and the opportunity for the adoption of new perspectives and behavioural change. It is equally important to implement strategies to support reflection in clinical learning settings.

**Purpose/objectives:** Participants will explore, through interactive discussion and personal examples, how best to work with learner physiotherapists to optimise the development of deep, meaningful and productive reflective skills that can be utilised beyond the delivered curriculum. At the end of the session, participants will be able to develop their own suite of evidence based strategies for assisting learner physiotherapists to optimise ongoing personal and professional development.

**Issues/questions for investigation or ideas for discussion:** Topics will be driven by participants, but may include the role of educators in University-based and clinical settings, tools for facilitating reflection and their effectiveness, evaluation of reflective practice in clinical settings and strategies for achieving reflexivity and a lifelong approach to learning.
GUIDANCE FOR THE CONSERVATIVE MANAGEMENT OF PATELLOFEMORAL PAIN: COMBINING INTERNATIONAL EXPERT OPINION WITH LEVEL 1 EVIDENCE

Christian Barton1,2, Simon Lack1, Steph Hemmings1, Saad Tufail1, Dylan Morrissey1
1Centre for Sports and Exercise Medicine, Queen Mary University of London, UK
2Complete Sports Care, Hawthorn, Melbourne, Australia

Question: What are the most effective conservative management approaches for patellofemoral pain (PFP)?

Design: Mixed-methods study.

Methods: A review of systematic reviews evaluating conservative management for PFP was completed in March 2013 to identify high quality reviews published in the past 5 years. Each identified review was evaluated for quality, and the conclusions of high quality reviews summarised. Semi-structured interviews with 17 international experts in the management of PFP explored clinical reasoning, current state of evidence, and anecdotal evidence. Experts possessed 5 years clinical experience minimum, publications related to PFP and were actively involved in research and management of PFP patients. The findings of both the review and interviews were combined to provide guidance in the management of PFP.

Results and Conclusion: Six high quality systematic reviews were identified and explored included perceptions of evidence, key management principles, and clinical reasoning when choosing various active and passive interventions. Key themes identified are evidence with current international expert opinion indicates a tailored multimodal intervention program, with an emphasis on education and activity modification is the key to effective PFP management. Active components should include quadriceps and gluteal exercise, with consideration to distal strengthening and movement pattern retraining. Stretching of the calf, hamstring and quadriiceps should also be considered based on individual assessment. Patellar taping should be applied to facilitate pain reduction in the early stages of rehabilitation. Additionally, foot orthoses, massage, PFP mobilisation and acupuncture may be considered as possible adjuncts in the management of PFP.

Key Practice Points:
- PFP should be managed through a tailored multimodal intervention program
- Interventions should include local proximal and distal exercise, movement pattern retraining, and patellar taping, with considerations to adjunctive interventions such as foot orthoses, massage, stretching and acupuncture.
- Clear education and activity modification combined with an emphasis on facilitating pain reduction are keys to an effective tailored program.

AN EVALUATION OF THE DELIVERY OF STREAM-SPECIFIC CLINICAL TRAINING TO JUNIOR PHYSIOTHERAPISTS IN A TERTIARY AUSTRALIAN PUBLIC HOSPITAL

Bastick EK1, O’Keefe DD1, Ryan DT1, Sturgess TR1, Saber KJ1, Morel LK1, Katz N1, Price JL1, McCarthy EA1, Ang AY1, Skinner EH2
1Physiotherapy Department Monash Medical Centre, Monash Health Melbourne
2Allied Health Research Unit, Monash University, Melbourne

Question: Does delivery of stream-specific clinical training for junior physiotherapists change their self-efficacy, self-rated confidence and self-rated ability to work weekend shifts?

Design: Prospective cohort study.

Participants: 19 junior physiotherapists from a tertiary public hospital.

Intervention: Physiotherapists undertook eight hours of education, specific to six clinical streams, over eight weeks. The program was repeated four times with physiotherapists rotating through clinical streams. Education sessions targeted stream-specific learning objectives.

Outcome Measures: Self-efficacy regarding stream-specific learning objectives was measured with a standard 0-100 scale (Bandura, 2006). Self-rated confidence in stream-specific learning objectives was measured using a 4-point confidence rating scale (not confident to independent). Self-rated ability to work stream-specific weekend shifts was measured using a yes / no rating.

Results: Post training, median improvement in self-efficacy across objectives ranged from 3 (95% CI: 0.10 to 1.0) to 43.3 (95% CI: 4.8 to 81.8) points, p < 0.05 for 81% of objectives. Self-rated confidence scores improved for 45.6% of stream-specific learning objectives; 52.8% were unchanged and 1.7% reported a decrease in confidence. Self-rated ability to work stream-specific weekend shifts increased 56% to 70%. No stream achieved a statistically significant increase in staff able to work weekend shifts (p range 0.10 to 1.0).

Conclusion: An eight hour stream-specific education program delivered to junior physiotherapists increased their self-efficacy, self-rated confidence but not self-rated ability to work weekend shifts. Results were non-randomised, unblended and actual practice change was not assessed. Future studies could investigate different educational structures in a blinded, randomised manner on clinical practice change.

Key Practice Points:
- Stream-specific formal education programs can increase junior physiotherapists self-efficacy, self-rated confidence and actual practice change.
- Stream-specific formal education programs did not achieve a statistically significant increase in self-rated ability to work weekend shifts.
- Future studies should focus on the effect of different educational structures on actual clinical practice change.
BALANCE IMPAIRMENT IN PEOPLE WITH A HISTORY OF MIGRAINE

Batchelor, FA, Williams SB, Vranstsidis, F, Hill KD, Murray K
1 National Ageing Research Institute, Parkville
2 Curtin University, Perth
3 Dizzy Day Clinic, Richmond

Questions: Do people with a history of migraine have worse balance than people without migraine?

Design: Observational study with age and gender-matched controls.

Participants: Fifteen people with migraine (mean age 51.9, SD = 10.6, 80% female) and 15 age and gender-matched controls (mean age 52.5, SD = 11.1, 80% female) were recruited.

Outcome Measures: We measured balance and mobility using clinical and force-platform measures (Timed Up and Go, Functional Reach, Step Test, Four Square Step Test, Neurocom Balance Master® Clinical Test of Sensory of Balance-CTSIB, limits of stability and gait parameters) at a one-off assessment as well as factors known to be associated with balance (vision, proprioception, strength, medications affecting balance).

Results: There were no differences between the groups on any factors known to influence balance. Generally all participants were within normal limits for their age on tests of balance and mobility. On most measures there was no difference between the two groups; however, two important differences were found: those with migraine displayed significantly greater sway on the tasks of the CTSIB with eyes closed (0.3 degrees/sec vs 0.1 degrees/sec, p = 0.007 on firm surface, and 1.2 degrees/sec vs 0.9 degrees/sec, p = 0.046 on foam, paired t-test).

Conclusion: We found that people with a history of migraine had increased sway compared to those without migraine when attempting to maintain stability on firm and foam surfaces with eyes closed. These results suggest that control of balance in this population may be more reliant on vision.

Key Practice Points:
• Physiotherapists should ask patients about a history of migraine
• Physiotherapists should comprehensively evaluate balance in people with a history of migraine
• Balance testing in people with a history of migraine should include visual conflict and low vision situations

WHAT DOES THE SIX MINUTE WALK TEST TELL US ABOUT SEVERE CHILDHOOD OBESITY?

Baxter H, Knott S, Harman M, Gray K
The Children’s Hospital at Westmead, Sydney

Childhood obesity is an increasing epidemic. The child weight management clinic at the Children’s Hospital at Westmead accepts referrals for children under 13 years old with body mass index z-scores of greater than 2.5. There is little evidence to support what objective measures should be used in this population.

Questions: Is the six minute walk test a reliable objective measure for this population?

Design: Retrospective chart audit.

Participants: Children who undertook a six minute walk test in the child weight management clinic.

Outcome Measures: Distance walked, heart rate, rate of perceived exertion and pulse oximetry.

Results: Twenty patients with a mean age 9.6 years (range 4.4 – 12.6 years), average body mass index 30.8 (range 20.8 – 42.6) and average body mass index z-score was 2.8 (± 0.36). Rate of perceived exertion was assessed in 11 children, of which four had a baseline measure greater than zero. Distance walked was an average of 525m (± 90.4). Heart rate increased by an average of 57.9% (pre versus post). Post-test the average rate of perceived exertion was two. Pre and post pulse oximetry was unchanged in 10 of 11 children measured. In children aged 7 – 12 years (n = 17) a fair negative correlation was found between body mass index z-score and six minute walk test distance (r = 0.41).

Conclusion: Severely obese children present with lower six minute walk test distances to age matched norms; however the six minute walk test result does not appear to strongly correlate with severity of obesity.

Key Practice Points:
• Severely obese children have significantly lower six minute walk test distances compared to the normal population
• There is a fair correlation between body mass index z-scores and six minute walk test distances in severely obese children.
• Further research needs to be undertaken to determine if changes in a body mass index z-score correlate to changes in six minute walk test distance for severely obese children.

AETIOLOGY INFLUENCES OUTCOMES FOLLOWING LOWER LIMB AMPUTATION

Batten HR, Nitz JC, Kuys SS, Varghese PN, McPhail SM
1 Princess Alexandra Hospital, Brisbane
2 The University of Queensland, Brisbane
3 Allied Health Research Collaborative, The Prince Charles Hospital, Brisbane
4 Griffith University, Gold Coast
5 Centre for Functioning and Health Research, Metro South Health, Brisbane
6 Queensland University of Technology, Brisbane

Questions: What are the demographics of people with lower limb amputation following inpatient rehabilitation? Do outcomes differ between dysvascular and nonvascular causes of lower limb amputation?

Design: Retrospective audit study.

Participants: 425 admissions (334 individuals) to inpatient rehabilitation following a lower limb amputation for seven years from 2005 to 2011.

Outcome Measures: Admission and discharge personal and social demographics of people with lower limb amputations were examined including age, gender, cause of amputation, employment status and place of birth. Discharge outcomes included length of stay, prosthetic prescription rates, and change of residence.

Results: Participants had a mean age 65 years (SD 14), length of stay 57 days (SD 42) and 75% were male (n=314). Dysvascular causes accounted for 80% (n=342); 72% were born in Australia. Prostheses were prescribed to 155 people (46%). Lower limb amputation resulted in 21% (n=89) of the people changing residence. Dysvascular amputees were older (mean 67 years, SD 12) than nonvascular (mean 54, SD 16) (p < 0.001). There was no difference in rehabilitation length of stay between dysvascular and nonvascular groups (mean difference 7 days 95% CI -3 to 17). Nonvascular amputees were more frequently working prior to amputation (34% vs 13%) and walking with a prosthesis at discharge (73% vs 52%).

Conclusion: Vascular causes of amputation were the largest contributor. The ageing population and rising obesity and diabetes rates will likely increase the number of people with lower limb amputations. Differences exist between dysvascular and nonvascular amputees which should be considered when designing rehabilitation programs.

Key Practice Points:
• Vascular causes for lower limb amputation are more common
• Differences exist in outcomes between vascular and nonvascular amputees—rehabilitation programs should address these differences
• 21% of amputees required more support and had to change residence post amputation—large cost to community as well as to individual.
**THE IMPACT OF PHYSICAL ACTIVITY LEVELS AND SEDATION ON PHYSICAL FUNCTION AND STRENGTH AT INTENSIVE CARE UNIT (ICU) DISCHARGE**

**Beach L1, Fetterplace K1, Edbrooke L5, Parry S1, Curtis R1, Rechntzer T2, Denely L2**

1The Royal Melbourne Hospital, Melbourne  
2The University of Melbourne, Melbourne

**Questions:** How does physical function change in the ICU? What is the relationship between physical function and physical activity (PA) levels and physical function and strength? Does sedation level correlate with PA?

**Design:** Prospective observational study.

**Participants:** 29 adults admitted to the ICU, mechanically ventilated for at least 48 hours and anticipated to require a further five days of care.

**Outcome Measures:** Highest level of daily activity (standardised scale), the Riker sedation and agitation scale, Medical Research Council (MRC) muscle strength scale and the physical function in intensive care test (PFIT).

**Results:** Mean (SD) age was 62.1 (16.0), mean (SD) APACHE II score was 26.1 (7.4), median (IQR) ICU length of stay was 8.0 days (5.0-11.5) and median highest level of activity at ICU discharge was transferred from bed to chair. Mean (SD) PFIT score at baseline 4.4 (2.2) increased by ICU discharge 5.6 (2.8) (p = 0.005); PA level and PFIT at ICU discharge demonstrated moderate to good correlation (rho = 0.666, p < 0.001). MRC and PFIT at ICU discharge demonstrated good to excellent correlation (rho = 0.83, p < 0.001). There was moderate to good correlation between sedation level and PA on day five (rho = 0.502, p = 0.02).

**Conclusion:** There was a good to excellent relationship between strength, physical activity and sedation level at day five. There was moderate to good correlation between sedation level and PA at day five.

**Key Practice Points:**
- There is a good to excellent relationship between strength, physical activity and sedation levels and PA on day five.
- This study provides objective activity levels of patients during an ICU stay.
- There is a moderate correlation between sedation level and PA at day five.

**Physiotherapists and Insurance Workers Perceptions and Beliefs of Roles in the West Australian Workers’ Compensation System**

**Beales D1, Ruscoe G2**

1School of Physiotherapy, Curtin University, Perth  
2Riley Physiotherapy Pty Ltd, Perth

**Question:** Is there consistency in the perceptions and beliefs of physiotherapists and insurance workers related to roles, communication barriers and return to work barriers?

**Design:** Cross-sectional.

**Participants:** Physiotherapist (n=80) and Insurance Workers (n=40)

**Methods:** Focus groups and expert consultation where used to develop an online questionnaire.

**Outcome Measures:** The questionnaire assessed participant’s perceptions and beliefs around the role of physiotherapists, insurance workers and injured workers within the Workers’ Compensation System. Additionally investigation was made of perceptions related to barriers in communication and barriers for returning injured workers to work.

**Results:** Physiotherapists and insurance workers had contrasting perception of the roles of each profession and injured workers based upon their own present experiences (Perception of Physiotherapists p < 0.01, Perception of Insurance Workers p < 0.01, Perception of Injured Workers p < 0.01). While their beliefs of roles were still statistically different (Beliefs of Physiotherapists Roles p < 0.01, Beliefs of Insurance Workers Roles p < 0.01), there was greater alignment of opinion. There was alignment of opinions with regard to both professions beliefs of the Injured Workers roles (p=0.20). There was contrast in Physiotherapists and Insurance Workers thoughts on communication barriers (p=0.01) and return to work barriers (p=0.01). Overall effective and efficient communication were identified as a central component of mismatched perception based on present experiences, seen as a critical component of ideal role attributes, and identified as a persistent barrier.

**Conclusion:** Both professions can potential benefit from the knowledge that the perception of their own role may differ from that of others.

**Key Practice Points:**
- Contrasts exist between Physiotherapists and Insurance Workers perceptions of the roles of each other, and of Injured Worker’s, in the West Australian Workers’ Compensation System.
- Beliefs of roles are more aligned.
- Greater knowledge of co-stakeholders perceptions and beliefs related to roles may assist in improving communication channels between stakeholders.

**Identification of Psychosocial Factors in Musculoskeletal Pain Subjects: Physiotherapists versus the Short Form Orebro Questionnaire**

**Beales D, Kendall M, Chang R, Hámsø M, Gregory G, Richardson K, O’Sullivan P**

School of Physiotherapy, Curtin University, Perth

**Question:** How do physiotherapists compare in their ability to identify psychosocial factors in subjects with musculoskeletal pain compared to the results from the Short Form Orebro questionnaire?

**Design:** Observational.

**Participants:** 90 patients with musculoskeletal pain and 19 physiotherapists.

**Outcome Measures:** Patients completed the Short Form Orebro questionnaire prior to their initial assessment with their physiotherapist. Physiotherapists completed a questionnaire following their initial evaluation, rating their opinion of the contribution of psychosocial factors to the patients clinical presentation. The physiotherapists ratings included an overall rating as well as individual ratings for the domains of the Short Form Orebro.

**Methods:** Correlations were performed between the Short Form Orebro and physiotherapist ratings.

**Results:** There was a fair correlation between the Short Form Orebro Questionnaire and the physiotherapists opinion of the overall contribution of psychosocial factors to the patients presentation (0.395). There was moderate correlation for the domains of recovery expectancy (0.528), self perceived ability to work (0.519) and ability to sleep (0.536). Where there fair correlations for anxiety (0.328) and depression (0.321), and a poor correlation for fear (0.187).

**Conclusion:** Physiotherapists opinions on contributing factors to the overall presentation of musculoskeletal pain patients were reasonably matched to a number of the domains assessed with the Short Form Orebro questionnaire. Physiotherapists opinions in relationship to anxiety, depression and fear was not as good. Potentially this might be an area where further education within the Short Form Orebro for these domains differs to the physiotherapists conceptualisation of these domains.

**Key Practice Points:**
- Physiotherapists opinions compare well to concepts of recovery expectancy, self perceived ability to work and ability to sleep from the Short Form Orebro.
- Physiotherapists opinions in relationship to anxiety, depression and fear was not as good, which may mean education for physiotherapists around identifying these issues may be needed.
Sleep, Kinesiophobia and Disturbed Body Schema Are Related to Disability in Chronic Pregnancy-Related Lumbopelvic Pain

Beales D1, Lutz A1, Thompson J1, Wand B1, O’Sullivan P2
1School of Physiotherapy, Curtin University, Perth.
2The School of Physiotherapy, The University of Notre Dame Australia, Fremantle.

Question: What psychophysical variables are related to disability in Australian women with chronic, pregnancy-related lumbopelvic pain?

Design: Cross-sectional.

Participants: Women where categorised into three groups: pain free (n=25), mild disability (n=15) and moderate disability (n=10). Disability categorisation was determined from the Oswestry Disability Index.

Methods: Participants completed questionnaires for thorough profiling of factors thought to be important in pregnancy-related lumbopelvic pain.

Outcome Measures: The Urinary Distress Inventory, Medical Outcomes Study Sleep Scale, Back Beliefs Questionnaire, Tampa Scale for Kinesiophobia, Depression Anxiety Stress Scale, Coping Strategies Questionnaire, Pain Catastrophising Scale, The Fremantle Back Awareness Questionnaire and the Mindful Attention Awareness Scale.

Results: Differences were identified for Sleep Quantity (p=0.03), the Catastrophising subset of the Coping Strategies Questionnaire (p=0.02) and The Fremantle Back Awareness Questionnaire (p=0.02).

Conclusion: Sleep dysfunction has been recognised as an important issue in chronic pain disorders, and has been related to pain sensitivity. Catastrophising may be seen as a negative cognition related to disability and pain amplification. The Fremantle Back Awareness Questionnaire assesses body-perception in lumbopelvic pain. Body schema disturbances have been previously linked to back pain but not pregnancy related lumbopelvic pain. The cross-sectional nature of this study does not allow for identification of directional pathways between these factors and disability. However, the study provides initial evidence for the need to consider sleep, catastrophising and body-perception in the clinical assessment and management of pregnancy-related lumbopelvic pain subjects.

Key Practice Points:
- Sleep dysfunction, catastrophising and altered body schema are related to disability in chronic pregnancy-related lumbopelvic pain.
- Sleep dysfunction, catastrophising and altered body schema should be considered as important factors in the clinical assessment and management of pregnancy-related lumbopelvic pain subjects.

Changes in Back Pain Beliefs in Post-Graduate Masters Musculoskeletal Physiotherapy Students

Beales D, Kendall M, O’Sullivan P
School of Physiotherapy, Curtin University, Perth

Question: Do the back pain beliefs of post-graduate physiotherapists enrolled in a musculoskeletal masters program change over 1 year?

Design: Repeated measures.

Participants: 14 post-graduate musculoskeletal physiotherapy students.

Outcome Measures: Back Beliefs Questionnaire, specific pelvic girdle pain belief questions and self-reported beliefs related to the role of psychosocial factors in musculoskeletal pain disorders.

Methods: Beliefs where assessed at the beginning of their Masters program (Week 1 Semester 1 2012). Specific teaching related to the management of lumbopelvic pain disorders within a biopsychosocial framework then occurred over a 3 week period. Beliefs where reassessed immediately after this teaching (Week 4 Semester 1), and again at the end of their course (end Semester 2).

Results: Back Beliefs Questionnaire was no different at the second time point, but significantly improved at the third time point (p<0.01). This was an increase of 4 points on the Back Beliefs Questionnaire scale, an amount previously determined to be a meaningful difference. In contrast, beliefs specifically related to pelvic girdle pain were improved at the second time point, with this being maintained at time point 3 (p<0.01). There was a self-reported improvement in the students abilities to identify (p<0.01) and manage (p<0.01) psychosocial factors in musculoskeletal pain disorders.

Conclusion: Positive changes in beliefs and self-reported improvement in the integration of psychosocial issues can be achieved with post-graduate education in musculoskeletal physiotherapy. This would appear to represent a positive shift consistent with best practice guidelines for the assessment and management of musculoskeletal pain disorders.

Key Practice Points:
- Positive changes in beliefs occur during post-graduate, Masters level musculoskeletal training.
- Additionally there was a self-reported improvement in the integration of psychosocial factors into clinical practice.
- These findings may be indicative of a positive shift in practice consistent with best practice guidelines.

Prognosis of Physical Function Following Ankle Fracture - A Systematic Review with Meta-Analysis

Beckenkamp PR1,2, Lin CW1,2, Rashid-Chagpar S1, Herbert RD1, van der Ploeg HP1, Moseley AM1,2
1The George Institute for Global Health, Sydney
2Sydney Medical School, University of Sydney
3Neuroscience Research Australia, Sydney
4Department of Public and Occupational Health, VU University Medical Center Amsterdam, the Netherlands

Question: What is the prognosis of physical function following an ankle fracture?

Design: A systematic review of quantitative studies with longitudinal data. Studies were identified using searches of electronic databases and grey literature to September 2012. Outcomes were converted to a common 100-point scale (high scores indicate better outcomes). A random effects meta-regression was conducted.

Participants: People of all ages with a traumatic ankle fracture. Foot or tumour-related fractures were excluded.

Outcome Measures: Physical function was operationalised as physical activity and/or activity limitation assessed either objectively or by self-report.

Results: The search yielded 6804 titles after duplicates were removed, 830 full-text papers were screened for eligibility, and 32 studies were included in the review. No studies measured physical activity, All 32 included studies measured activity limitation and 23 of these studies, all involving adults, provided data for the meta-analysis. Adults with ankle fracture present with significant activity limitation soon after injury (mean 9.4, 95% confidence interval 0 – 31.8), improved markedly within the first six months (to mean 74.1, 95% confidence interval 68.2 – 81.1) and showed little improvement between 6 and 24 months (mean at 24 months 82.4, 95% confidence interval 74.1 – 91.8).

Conclusion: On average, adults with ankle fracture have significant activity limitation in the early stages post-injury. Although activity limitation rapidly diminishes in the first 6 months, recovery is incomplete 24 months post injury. Studies assessing the levels of physical activity post ankle fracture are needed in order to better understand the prognosis of physical function in this population.

Key Practice Points:
- Adults with ankle fracture present with significant activity limitation after the injury
- On average, there is rapid recovery in the first six months post-fracture, but recovery remains incomplete at 24 months
- Studies measuring physical activity levels are needed in this population
DIFFERENTIAL ATROPHY IN THE LOWER-LIMB MUSCLES AFTER 90-DAYS BEDREST

Belavy DL1, Rittweger J2, Ohshima H3, Felsenberg D4
1Centre for Muscle and Bone Research, Charité University Hospital, Berlin, Germany
2German Aerospace Center (DLR), Institute of Aerospace Medicine, Cologne, Germany
3Human Space Technology and Astronauts Department, Japan Aerospace Exploration Agency (JAXA), Tsukuba, Japan

Question: What patterns of muscle atrophy occur in the lower limbs of bedridden patients?

Design: Prospective observational study.

Participants: Sixteen male subjects completed 90days of strict bedrest as part of the “Long Term Bed Rest” (LTBR) study in Toulouse, France. The subjects did not perform any kind of exercise.

Outcome Measures: Axial magnetic resonance images were taken encompassing the femoral head down to the foot. Scanning was performed before bedrest, on days29 and 89 of bedrest and then 13, 90, 180 and 360 days after bedrest. The volumes of individual muscles were measured. Unless otherwise stated p < 0.0000000001.

Results: At the end of 90days bedrest, the greatest extents of atrophy in the lower-limb was seen in the gastrocnemius medialis (28.0%) and soleus (26.6%) muscles. The remaining muscles of the posterolateral calf lost between 19% and 24% of their volume. In the hamstrings, the biceps femoris long head (18.4%) and semimembranosus (18.0%) atrophied more than short head of biceps femoris (6.8%; p=0.0003) and semitendinosus (7.2%; p=0.00001). The vast (20.5%) atrophied more than rectus femoris (7.9%), but vastus intermedius (22.3%) atrophied more than medialis (19.7%) and lateralis (17.0%). In the hip adductor muscles, atrophy was greatest in magnus (13.8%), followed by sartorius (9.2%) and longus (7.0%; p=0.011) with no significant change in brevis (2.3%;p=0.25) or gracilis (2.5%;p=0.16). Around the hip, the greatest losses were seen in quadratus femoris (13.5%), followed by iliotibial (6.3%; p=0.012) with no change in the obturator externus (1.9%;p=0.42) or internus (3.6%; p=0.08).

Conclusion: Differential muscle atrophy occurs amongst synergistic muscles in disuse.

Key Practice Points:

- In disuse, greatest atrophy occurs in disuse in the plantarflexor muscles followed by the vasti and parts of the hamstrings.
- Within synergistic groups, such as in the adductors, some members atrophy more than others in disuse and this would need to be considered in exercise prescription.

BONE DENSITY AND NEUROMUSCULAR FUNCTION IN OLDER COMPETITIVE ATHLETES DEPEND ON RUNNING DISTANCE

Gast U1, Belavy DL1, Armbrrecht G1, Kusy K2, Lexy H3, Rawer R1, Rittweger J4, Winwood K2, Zielinski J1, Felsenberg D4
1Centre for Muscle and Bone Research, Charité University Hospital, Berlin, Germany
2Eugeniusz Plasecki University School of Physical Education, Poznań, Poland
3Novotec Medical, Pforzheim, Germany
4German Aerospace Center (DLR), Institute of Aerospace Medicine, Cologne, Germany

Question: What is the relationship between different types of physical activity and bone, lean mass and neuromuscular performance in older individuals?

Design: Cross-sectional study.

Participants: 50 short-distance (runners up to 400m distance), 19 middle-distance (800m to 1500m runners) and 109 long-distance (runners 2000m and above) athletes were measured at the 15th European Masters Championships in Poznań, Poland.

Outcome Measures: Dual X-ray absorptiometry was used to measure areal bone mineral density (aBMD) and lean tissue mass. Maximal countermovement jump, multiple one-leg hopping and maximal grip force tests were performed.

Results: Short-distance athletes showed significantly higher aBMD at the legs, hip, lumbar spine and trunk compared to long-distance athletes (p<0.0012). Countermovement jump performance, hop force, grip force, leg lean mass and arm lean mass were greater in short-distance athletes (p<0.007). A similar pattern was seen in middle-distance athletes who typically showed higher aBMD and better neuromuscular performance than long-distance athletes, but lower in magnitude than short-distance athletes. In all athletes, aBMD was not below the expected age-adjusted average.

Conclusion: The step-wise relation between short-, middle- and long-distance athletes on bone suggests that the higher-impact loading protocols in short-distance disciplines are more effective in promoting aBMD. The regional effect on bone, with the differences between the groups being most marked at load-bearing regions (legs, hip, spine, trunk) rather than non-load-bearing regions, is further evidence in support of the idea that bone adaptation to exercise is dependent upon the local loading environment, rather than as part of a systemic effect.

Key Practice Points:

- It is important to understand which exercise protocols are more effective for building or maintaining bone with age
- High-impact explosive type exercises appear to be more effective for bone
- This higher bone density in explosive sport types is associated with greater leg muscle size, jumping height and grip strength

WHOLE-BODY VIBRATION VERSUS PROPRIOCEPTIVE TRAINING ON POSTURAL AND NEUROMUSCULAR PERFORMANCE IN POST-MENOPAUSAL OSTEOPENIC WOMEN

Stolzenberg N1, Belavy DL1, Armbrrecht G1, Beller G1, Rawer R2, Semler J2, Felsenberg D4
1Centre for Muscle and Bone Research, Charité University Hospital, Berlin, Germany
2Novotec Medical, Pforzheim, Germany
3Centre for Osteology and Metabolic Diseases, Immanuel Krankenhaus, Berlin, Germany

Question: Is whole-body vibration exercise with resistive exercise (VIB) more effective for balance and neuromuscular performance than proprioceptive exercise with resistive exercise (BAL) in post-menopausal women with low bone density?

Design: Randomised trial with intention-to-treat analysis.

Participants: 68 post-menopausal women with low bone density (T-score -2.0 and -3.0 SD) were included in the study.

Intervention: All subjects performed a twice weekly resistive exercise program for major muscle groups over a 9-month period. The VIB-group received additional four minutes of whole-body vibration on the Galileo Fitness. The BAL-group performed 15 minutes of progressive proprioceptive and balance exercises using different equipment and/or surfaces.

Outcome Measures: The primary outcome was speed of platform movement during single leg stance on an unstable testing surface. This test was performed every month. Secondary outcomes, examined at baseline and end-month-9, included countermovement jump power, multiple single-leg hop acceleration, chair-rising-test time and calf muscle cross-sectional area.

Results: Balance performance improved in both groups (p<0.001), but the response did not differ between the two groups (p=0.45). Response of countermovement jump power did differ between the two groups (p=0.004), with a +0.9 (95% CI 0.3 to 1.5) W/kg greater change in VIB than BAL. For the remaining parameters no significant differences were seen between groups on the intent-to-treat analysis (p≥0.08).

Conclusion: The current study could not provide evidence for a significantly different impact of whole-body vibration or balance training on postural control. However, whole-body vibration exercise does appear to modulate some aspects of peak neuromuscular function.

Key Practice Points:

- It is important to better understand exercise prescription for people at risk of bone fractures
- Performed twice weekly, resistive exercise with whole-body vibration or proprioceptive training had a similar effect on balance
- Whole-body vibration exercise may be more effective for peak neuromuscular performance in this population.
THE EFFECT OF A REDUCTION IN EXERCISE SESSIONS ON 6-MINUTE-WALK-TEST OUTCOMES IN CARDIAC REHABILITATION

Bellet RN1, Francis RL2, Jacob JS1,2, Healy KM2, Bartlett HJ4,5, Adams L1, Morris NR1

1Physiotherapy Department, The Prince Charles Hospital, Brisbane, Queensland, Australia
2Cardiac Rehabilitation and Prevention Program, Chermside Adult Community Health Centre, Brisbane, Queensland, Australia
3The Prince Charles Hospital, Brisbane, Queensland, Australia
4School of Mathematical Sciences, Queensland University of Technology, Queensland, Australia
5School of Rehabilitation Sciences and Griffith Health Institute, Griffith University, Gold Coast Campus Southport, Queensland, Australia

Background: Similar risk factor reduction and improved uptake rates have been found in home-based/telephone cardiac rehabilitation (CR) models when compared with facility-based CR; however, exercise-based CR appears necessary for mortality benefits. CR-models with less exercise sessions may be as effective as traditional models.

Design: A randomized controlled trial.

Methods: Fast-track and traditional treatment groups undertook supervised low-moderate intensity exercise training for 6 weeks including home exercise advice. The programs included once-weekly exercise sessions and a one-off 7-hour education session for fast-track, and twice-weekly sessions of both exercise and education for traditional. Six-minute-walk-distance (6MWD) and secondary outcome measures were collected pre-CR, post-CR, and at 6-months-post-CR.

Results: Sixty-one of 154 subjects consented to participate in the study. Complete 6MWD datasets were available for 13 (52%) fast-track and 26 (75%) of traditional CR subjects. 6MWD outcomes were similar for fast-track and traditional groups over all assessments combined and at any time point. Most other outcomes were not different between treatment groups. However, while fast-track subjects were more physically active post-CR (p<0.05) and worked more hours over all times (p<0.05), they also smoked more cigarettes at each assessment (p<0.05) and over all times (p<0.01) than the traditional group.

Conclusion: One exercise session per week was as effective as two sessions for 6MWD and most secondary outcomes measured. Traditional CR participants were more likely to cease smoking, while fast-track subjects participated in work to a greater extent than traditional subjects.

RELIABILITY OF THE MODIFIED TARDIEU SCALE FOR THE ASSESSMENT OF LOWER LIMB SPASTICITY IN ADULTS WITH NEUROLOGICAL INJURIES

Ben-Shabat E1, Palit M1, Fini NA1, Brooks C3, Winter A1, Holland AE1,2,3

1Caulfield Hospital, Alfred Health, Melbourne
2Alfred Health, Melbourne
3La Trobe University, Melbourne

Question: Are intra and inter-rater reliability of the Modified Tardieu Scale (MTS) acceptable for lower limb assessment of adults with chronic neurological injuries?

Design: Single centre prospective observational study. Two experienced physiotherapists performed slow (R2) and fast (R1) passive movements on the same day and qualitatively rated the resistance to R1. A third physiotherapist took goniometric measurements. One physiotherapist repeated the assessment 1-3 days earlier or later. Muscles tested were: hip adductors, rectus femoris, quadriceps, hamstrings, gastrocnemius, soleus, tibialis anterior and posterior.

Participants: Thirty adults with chronic neurological injuries and lower limb spasticity.

Outcome Measures: Intraclass Correlation Coefficients (ICCs) and Limits of Agreement. Kappa Coefficients (k) were calculated for tibialis range of movement and qualitative spasticity ratings.

Results: Intra and inter-rater RL and R2 measurements showed moderate to high reliability for the affected hamstrings, rectus femoris, gastrocnemius soleus (ICC=0.79 Mean +0.08 SD) and tibialis anterior muscles (k=0.58+0.10). Only intra-rater measurements of affected tibialis posterior were moderately reliable (R1 k=0.57, R2 k=0.77). Seven of the 16 spasticity angle measurements were moderately reliable (ICC=0.70+0.06). Limits of Agreement were large (41±25°). Qualitative spasticity ratings were moderately reliable for the affected hamstrings, gastrocnemius, and tibialis muscles (k=0.52±0.10).

Conclusion: For the first time we have shown that the MTS is consistent for assessing spasticity in the majority of lower limb muscles of adults with various chronic neurological injuries. Consistency was best for R1 rather than spasticity angle measurements or qualitative ratings of spasticity. Optimal, MTS measurements should be undertaken by the same clinician.

Key Practice Points:

• The Modified Tardieu Scale measurements are consistent for spasticity assessment of most lower limb muscles of adults with a range of neurological injuries.
• Fast passive movement measurements are the most consistent spasticity measurements.
• Repeat Modified Tardieu Scale measurements are best taken by the same clinician.

HOW SHOULD WE MEASURE DIASTASIS OF THE RECTUS ABDOMINIS MUSCLE (DRAM): A SYSTEMATIC REVIEW AND RELIABILITY META-ANALYSIS

Van de Water ATM1,2, Benjamin, DR3

1Department of Physiotherapy, School of Allied Health, La Trobe University, Bundoora
2Angliss Hospital, Eastern Health, Upper Ferntree Gully

Question: How should we measure diastasis of the rectus abdominis muscle (DRAM)?

Design: Systematic review and meta-analysis of psychometric properties of methods measuring DRAM width.

Participants: Eleven eligible studies were found evaluating intra-rater, inter-rater, test-retest reliability, measurement error and/or concurrent validity of various measurement methods. Quality of studies (COSMIN assessment) varied from poor to very good, some with design flaws concerning blinding of assessors or very small sample sizes.

Intervention: none.

Outcome Measures: DRAM width using the palpation or ‘finger width’-method; calipers, ultrasound, MRI, CT, and Intra-operative measurements (ruler).

Results: Providing evidence for convergent validity, moderate to high correlations (Pearson’s r=0.66-0.79) were found between calipers and ultrasounds measurements, and high correlations between MRI or CT and intra-operative measurements. Reliability data showed that calipers (3 studies) and ultrasound (4 studies) had generally high Intraclass Correlation Coefficients (ICC) of 0.78 to 0.97 with small standard error of measurement for test-retest, inter- and/or intra-rater reliability. The two methods had good agreement (83%; kappa=0.66) for discriminative purposes (1 study). Also, for measurements above the umbilicus low measurement error was found for calipers measurements compared to ultrasound (1 study). Two studies evaluated the ‘finger width’-method; one used inappropriate statistics for inter-rater reliability estimations; the second showed good intra-rater reliability and moderate agreement between raters.

Conclusion: Several methods are available for measuring DRAM width. Calipers and ultrasound are reliable methods to measure DRAM width. There is limited psychometric information on measurements from scans and other clinical methods. The purpose of measurement of DRAM width, screening or evaluation, is of great importance on the choice of measurement method.

Key Practice Points:

• Measure DRAM with a purpose: discriminate (clinical screening) or monitor
• Available psychometric suggest that calipers and ultrasound are reliable methods from measurement of DRAM width
• Further high quality psychometric studies are needed on clinically feasible methods for measurement of DRAM width.
CENTRAL PROCESSING AND HEMISPHERIC DOMINANCE OF WRIST PROPRIOPCEPTION
Ben-Shabat E1,2,3, Brodtmann A1, Matyas TA1,2, Pell GS2, Carey LM1,2,3
1Florey Neuroscience Institutes, Melbourne
2La Trobe University, Melbourne
3Caulfield Hospital, Alfred Health, Melbourne

Questions: What are the high order brain areas that process wrist proprioception? Is there evidence of hemispheric dominance in these areas?

Design: Prospective observational study. Functional MRI scans were taken during an original event-related proprioceptive experimental design.

Participants: Twelve healthy right handed participants aged 20–30 years old.

Outcome Measures: Random effect analyses (Statistical Parametric Mapping, SPM2) for identifying key brain regions activated during left and right wrist proprioception (LWP and RWP respectively). Laterality index (LI) calculations for quantifying hemispheric asymmetries in the key brain regions identified.

Results: In addition to the expected activation in the contralateral primary sensory and motor cortices, proprioception-related brain activation was found in the right supramarginal gyrus (SMG: LWP Talairach coordinates x,y,z 52,-40,37; Z=4.51; RWP 56,-38,29, Z=4.24) and the contralateral dorsal premotor cortex (PMd: LWP 32,-26,69, Z=4.10; RWP -32,-26,64, Z=3.93). Right hemispheric dominance was found particularly in the SMG (LWP LI=0.41; RWP LI=0.74), and to a lesser degree in the PMd (LWP LI=0.34; RWP LI=-0.13).

Conclusion: This study is the first examination of brain activation during a proprioceptive discrimination task which required accurate responses. Fronto-parietal activation was identified in high order cortices including the SMG and PMd. Right hemispheric dominance was found in this network, particularly in the SMG. Studies of healthy participants and persons with neglect have also implicated the importance of the right SMG in processing of spatial stimuli. Activation in the PMd may be related to the relevance of proprioceptive inputs for movement preparation.

Key Practice Points:
• Person with PMd and / or SMG lesions may be susceptible to proprioceptive deficits.
• Person with right hemispheric lesions may be more likely to experience proprioceptive deficits compared to left hemispheric lesions.
• Person with spatial neglect may be affected by proprioceptive deficits in addition to their attentional deficits.

HOW ACCURATE IS PROPRIOPCEPTION? A PSYCHOPHYSICAL STUDY OF WRIST PROPRIOPCEPTION
Ben-Shabat E1,2,3, Brodtmann A1, Matyas TA1,2, Carey LM1,2
1Florey Neuroscience Institutes, Melbourne
2La Trobe University, Melbourne
3Caulfield Hospital, Alfred Health, Melbourne

Questions: What is the mathematical function that describes the relationship between proprioceptive stimuli and responses, and what are its parameters? Do these parameters differ between left and right wrists?

Design: Observational study of the Wrist Position Sense Test.

Participants: Thirty-seven healthy right handed participants.

Outcome Measures: Coefficient of determination (r²) for the best suited model. Model description and comparisons of left and right wrist model parameters with Wilcoxon T tests.

Results: The linear model best described the relationships between proprioceptive stimuli and responses: left r² = 0.956 Mean + 0.018 SD, right 0.962 + 0.022. Model parameters: constants- left -7.98 + 20.12, right -7.69 + 12.51, slopes- left 1.06 + 0.19 right 1.12 + 0.18, variable errors- left 6.72 + 2.05, right 5.76 + 1.74. Differences between left and right wrist model parameters were significant for the slopes p = 0.002 and variable errors p = 0.021, but not for the constants p = 0.878.

Conclusion: Wrist proprioception is associated with systematic and variable errors. Wrist positions are perceived to be more extended than they truly are regardless of the wrist position or the wrist tested. Joint movements are overestimated particularly for the right wrist. Left wrist proprioception was more variable than that of the right wrist. These findings suggest that even in the absence of neurological deficits wrist proprioception is inaccurate. Furthermore, the nature of the errors differs between the left and right wrists. This study sheds a new light on our current understanding of normal proprioception.

Key Practice Points:
• A degree of error should be expected when testing wrist proprioception in the absence of pathology.
• Some errors are systematic whilst others are variable.
• Errors differ between left and right wrists.

EFFECTS OF EXERCISE ON DIASTASIS OF THE RECTUS ABDOMINIS MUSCLE (DRAM) IN THE ANTE-NATAL AND POST-NATAL PERIOD: A SYSTEMATIC REVIEW
Benjamin, DR1, Van de Water ATM2, Peiris CL2
1Angliss Hospital, Eastern Health, Upper Ferntree Gully
2Department of Physiotherapy, School of Allied Health, La Trobe University, Bundоро

Biography: Deenika Benjamin is an experienced Australian physiotherapist, Master in Musculoskeletal Physiotherapy and specialised in Women’s Health musculoskeletal related conditions. After graduating from La Trobe University, she has successfully completed many courses in Musculoskeletal and Women’s Health physiotherapy.

How many years of teaching at La Trobe University and APA courses, Deenika has gained research experience through the Allied Health Clinical Research Office at Eastern Health, and focuses currently on measurement and treatment of diastasis of the rectus abdominis muscle.

Questions: Do non-surgical interventions (such as exercise) prevent or reduce diastasis of the rectus abdominis muscle (DRAM)?

Design: Systematic review with meta-analysis conform PRISMA guidelines.

Participants: From 1362 citations identified through electronic database searches, 8 studies were eligible and included a total of 336 women during ante- and/or post-natal period. The design of included studies ranged from case study to randomised controlled trial.

Intervention: All interventions included some form of exercise. Prescribed exercises mostly targeted abdominal/core strengthening. Abdominal exercises focused in particular on transversus abdominis muscle activation. Exercise was carried out as only treatment or in conjunction with corset/tubigrip application, and/or education.

Outcome Measures: Primary outcomes were DRAM presence/absence and DRAM width. Secondary outcomes were back pain, abdominal strength, ability to complete ADL and quality of life.

Results: DRAM prevention data from 3 pooled studies (n=226) showed that exercise during the ante-natal period reduced the presence of DRAM by 35% (Risk Ratio 0.65, 95%CI 0.46 to 0.92).

Conclusion: Based on the available evidence and quality of this evidence, non-specific exercise may or may not help prevent DRAM or reduce DRAM during the pre-natal and post-natal period. Further high quality research is required to confirm these findings, and to evaluate the effectiveness of abdominal exercise on secondary outcomes. PROSPERO registration: CRD42012002944.

Key Practice Points:
• Abdominal exercises may prevent DRAM, and may reduce DRAM width
• Evidence is currently limited to mainly low quality studies
• Further high quality studies are needed to confirm these findings
AN INTENSIVE PHYSIOTHERAPY PROGRAM FOR A PERSON WITH LOCKED IN SYNDROME: A CASE REPORT

Bew PG
Queensland Health

Question: Is an intensive, functional task related physiotherapy program able to be developed and implemented for a person with Locked In Syndrome and if so, are functionally relevant gains possible?

Design: Single subject case report.

Intervention: An intensive task related training program was developed for a person with Locked In Syndrome. Basic rehabilitation principles of specific task practice, strength and endurance training and aerobic exercises which were intensive and progressive informed the development of a physiotherapy program which was implemented over the course of an 11 month subacute rehabilitation stay.

Outcome Measures: Functional mobility measures (transfer assistance, wheelchair mobility and assisted ambulation) and sitting balance time.

Results: On initial presentation the person had no movement below the level of his eyes. He was cognitively intact and eye movements were preserved. He required four to five person assistance with hoist transfers and was able to hold his head unsupported for 20 seconds. He required four person assistance to roll. He was able to sit only with full head, trunk and limb support. At the completion of his rehabilitation he required two person assistance with hoist transfers and rolling in bed, had independent head control, was able to sit unsupported for up to 20 minutes and was independent in a powered chair utilising head controls. This case report outlines the specific physiotherapy program that contributed to these functionally significant gains.

Conclusion: For this person a functional and intensive physiotherapy program contributed to meaningful and significant functional gains.

Key Practice Points:
- An intensive, progressive and functional task related program was feasible for this person who had severe and significant impairments.
- The physiotherapy program contributed to meaningful functional gains for this person.

DEVELOPMENT OF A CLINICAL ASSESSMENT WORKLOAD MODEL FOR THE HEALTH PROFESSIONS: MEDICINE, NURSING, OCCUPATIONAL THERAPY, PHYSIOTHERAPY AND PODIATRY

du Toit V1, Bialocerkowski A2, Hu N3
1School of Medicine, University of Western Sydney, Sydney
2Griffith Health Institute, Griffith University, Gold Coast

Question: What is the impact of conducting clinical assessments on the workload of clinical supervisors in various health professions?

Design: (1) Observational study using video ethnography and audiotaping to examine the tasks and the time required by clinical supervisors for workplace-based assessment of students in hospitals and community settings in Greater Western Sydney. Identified themes were used to develop a preliminary clinical supervisor workload model for workplace-based clinical assessment. (2) A consensus study, using the Delphi technique, was undertaken to further develop the empirically-based workload model.

Participants: (1) 15 supervisors selected by peer nomination from the health professions of medicine, nursing, occupational therapy, physiotherapy and podiatry and their students from these graduate-entry health programs. (2) 10 workplace-based clinical assessment experts from the five health professions.

Results: The empirically-based clinical supervisor workload model for workplace-based clinical assessment consists of 10 themes: planning/organisation, documentation, feedback, communication, observation/decision-making/judgement, acquisition/training, personal orientation, system/structure, expertise, student characteristics.

Conclusion: Workplace-based assessment is used by health professions to ensure students meet professional competency criteria, however limited research has been available on the supervisory workload involved in these assessments (where patient wellbeing is paramount). This study provides an understanding of the supervisory tasks associated with workplace-based assessments and proposes a model, which could be used in the future as a basis for appropriate institutional support for supervisors.

Key Practice Points:
- Clinical assessment is more likely to be effective if workloads are not excessive.
- Clinical supervisors will benefit from well-designed placement training and support.
- This study identified that workload associated with clinical assessment consists of 10 themes: planning/organisation, documentation, feedback, communication, observation/decision-making/judgement, acquisition/training, personal orientation, system/structure, expertise, student characteristics.

ENABLING CLINICAL SUPERVISORY SKILLS IN NON-TRADITIONAL PRACTICE AREAS (MENTAL HEALTH, AGED CARE, INDIGENOUS, RURAL AND REMOTE SETTINGS): PHYSIOTHERAPY EXPERIENCES

Bialocerkowski AE1, Croker A1, Laasko EL1
1Griffith Health Institute, Griffith University, Gold Coast

Question: What kind of support and training is required to enhance the clinical supervision capacity of physiotherapists across four non-traditional clinical education practice settings: mental health, aged care, Indigenous, and rural and remote settings in Queensland?

Design: Prospective, observational, needs analysis study using mixed methods (semi-structured interviews, questionnaires, focus groups).

Participants: Past and present physiotherapy clinical supervisors, future physiotherapy clinical supervisors, physiotherapy clinical supervisor coordinators, university and workplace physiotherapy Department Directors.

Outcome Measures: Semi-structured interviews, questionnaires and focus groups to identify clinical education supervisory resources, gaps in resources and opportunities in supervision support across four practice settings in Queensland.

Results: Department of Health (Queensland) has a well developed system for supporting and training physiotherapy clinical supervisors. These opportunities are limited outside the Department. A vast number of supervisory resources currently exist that are relevant to physiotherapy. Awareness of these resources is limited, with most not accessible to supervisors outside the Department of Health. Intellectual property associated with these resources has been cited as a barrier. Opportunities exist to bring together resources.

Conclusion: This study identified and catalogued physiotherapy clinical supervisory resources and the needs of the physiotherapy clinical supervisory workforce in Queensland. There is a lack of knowledge of existing clinical supervisory resources available for physiotherapists in non-traditional practice areas. A divide exists in access to physiotherapy clinical supervisory resources between supervisors employed in the Department of Health and in other practice settings, such as schools, non-government organisations, charitable organisations and private industry.

Key Practice Points:
- A vast number of physiotherapy clinical supervisory resources currently exists.
- There is a lack of knowledge of existing clinical supervisory resources for physiotherapists supervising students in non-traditional practice areas.
- A divide currently exists with respect to access of resources between supervisors employed by the Department of Health and other organisations.
Student and Educator experiences with using a remotely accessed simulated learning environment during musculoskeletal clinical education placements: A pilot study

Bialocerkowski AE, Tuttle N
Griffith Health Institute, Griffith University, Gold Coast

Questions: What are the advantages and challenges of using a remotely accessed simulated learning environment during musculoskeletal clinical education placements?

Design: Prospective, descriptive study.

Participants: Twelve entry-level physiotherapy students and six of their clinical educators who were undertaking 5-week musculoskeletal clinical placements.

Intervention: Students at their clinical placement sites accessed an on-campus simulated learning environment, via a teleconferencing platform, for approximately 20% of their usual 5-week full-time musculoskeletal clinical placement. The simulated environment involved students assessing and treating simulated patients through remote provision of service using telerehabilitation. The scenarios were designed to address demonstrated areas of need, gained from registration boards, professional indemnity insurers, published injury statistics and perceptions from employers. Students worked in pairs moving between live interaction, viewing pre-recorded assessment videos, peer review and discussion with the clinical facilitator.

Outcome Measures: Themes were extracted from custom-designed questionnaires which elicited information on perceptions of the usability, advantages and challenges of participating in this remote simulated learning during a musculoskeletal clinical placement.

Results: All students reported that this project improved communication skills or increased their knowledge of presenting conditions. All educators reported the experience as positive. It freed up time for non-student related work tasks, supplemented patient case load and provided a safe and effective environment for student learning and reflection. The major challenge identified by all students and some educators was finding a solution to software and connectivity issues.

Conclusions: Remotely accessed simulated learning environments can have a positive impact on student and educator experiences during musculoskeletal clinical placements.

Key Practice Points:
- Remotely accessed simulated learning environment for musculoskeletal clinical placement is a novel adjunct to standard clinical placements.
- There are advantages of incorporating this model into physiotherapy clinical placements, for both students and educators.
- To capitalise on the potential advantages, software and connectivity challenges need to be overcome.

A model of clinical education for remote placements: a student perspective

Bird M-L, Andrews K, Mackintosh S
The University of Tasmania and The University of South Australia

Questions: In partnership, The University of Tasmania (Utas) and the University of South Australia (UniSA) have embarked on a project to train Tasmanian students with the bulk of the placement opportunities in Tasmania; remote from the host University, with four students in each cohort. This paper focusses on the perceived benefits and challenges to this model of education from the student point of view.

Participants: Eight students who will graduate in 2013.

Outcome Measures: Structured questionnaires where developed in collaboration between staff at the UTas and UniSA to capture both quantitative and qualitative data to be collected and collated.

Results: 75% of students responded. Prior to commencing the program, lack of information around course costs and infrastructures (like accommodation) were identified. All students felt that the pre-clinical intensive placements prepared them for placements. Placements experiences varied, as did the levels of communication between university and placement sites and the support that students felt while on placement. Lack of access to libraries and unfamiliarity of the Tasmanian placement providers with the UniSA requirements were perceived differences in placement experiences to the SA cohort. Half of the respondents would have attended physiotherapy at another university if they had not chosen this pathway. Eighty per cent plan to work in Tasmania in the future. Links with people and the profession made during the placements were given as reasons for this.

Conclusion: Providing ongoing placements for core areas of physiotherapy in regions remote from the host University has both challenges and benefits.

Key Practice Points:
- This pathway gives students opportunities to study physiotherapy that they would not have without this option.
- Communication with students about costs and accommodation in remote placements is important.
- Future workforce may be supported by ongoing placements experiences in an area remote from the University.

Translating Education into Practice: Bridging the Greater Divide

Bird M-L, Andrews K, Mackintosh S
The University of Tasmania and The University of South Australia

Questions: How much time do staff spend in sedentary behaviours in the workplace at an Australian university?

Design: Prospective observational study.

Participants: Twelve full-time staff.

Outcome Measures: Staff activity level (in METs) in the workplace was recorded over five consecutive work days using an accelerometer (Sensewear). The time spent in sedentary (less than 1.5 METs), light (1.5 to 3 METs), moderate (3-5 METs) or vigorous (over 5 METs) activity was determined. Perception of sedentary time (Occupational Sitting and Physical Activity Questionnaire) and physical activity levels (WHO physical activity guidelines) were also recorded.

Results: Data from sixty days were analysed. On average each participant spent 72.3% (352 minutes) of their work day in sedentary activities (less than 1.5 METs), 17.4% in light activities (1.5 to 3 METs) and 9.4% in moderate activity (3-5 METs). Self-reported sedentary time was underestimated in half of the staff, with a range of -75% to 64%. There was no significant difference for time spent in each quintile of energy expenditure between staff that met and did not meet the WHO physical activity guidelines.

Conclusion: In a University workplace staff spend considerable time as sedentary, and an individual’s perception of sedentary behaviour may often be underestimated. As sedentary time is associated with increased risk of adverse health effects interventions to reduce sedentary time and enhance awareness of sedentary behaviour should be considered.

Key Practice Points:
- University staff spend long periods of their workday in activities with low metabolic output.
- Staff that meet the WHO physical activity guidelines take part in considerable sedentary behaviour in the workplace.
- Self-perception of sedentary time is poor.

We Should Know Better – Rates of Sedentary Behaviours in a University Workplace

Bird M-L, Cecilia M. Shing CM, Cooley D, Pedersen S
The University of Tasmania

Questions: How much time do staff spend in sedentary behaviours in the workplace at an Australian University?

Design: Prospective observational study.

Participants: Twelve full-time staff.

Outcome Measures: Staff activity level (in METs) in the workplace was recorded over five consecutive work days using an accelerometer (Sensewear). The time spent in sedentary activities (less than 1.5 METs), light (1.5 to 3 METs), moderate (3-5 METs) or vigorous (over 5 METs) activity was determined. Perception of sedentary time (Occupational Sitting and Physical Activity Questionnaire) and physical activity levels (WHO physical activity guidelines) were also recorded.

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Conclusion: In a University workplace staff spend considerable time as sedentary, and an individual’s perception of sedentary behaviour may often be underestimated. As sedentary time is associated with increased risk of adverse health effects interventions to reduce sedentary time and enhance awareness of sedentary behaviour should be considered.

Key Practice Points:
- University staff spend long periods of their workday in activities with low metabolic output.
- Staff that meet the WHO physical activity guidelines take part in considerable sedentary behaviour in the workplace.
- Self-perception of sedentary time is poor.
COLD HYPERALGESIA PREDICTS SLOWER RECOVERY IN LATERAL EPICONDYLALGIA: A 12-MONTH PROSPECTIVE STUDY OF PROGNOSIS

Coombes B1, Bissett L2,3, Vicenzino B4
1The University of Queensland, Brisbane
2Griffith University, Gold Coast
3Gold Coast Hospital & Health Service, Gold Coast

Question: Do physical and psychological factors predict short- and long-term recovery in lateral epicondylalgia?

Design: Post hoc intention to treat analysis of a placebo controlled, randomised clinical trial.

Participants: 165 subjects with a clinical diagnosis of lateral epicondylalgia.

Intervention: Multimodal physiotherapy and corticosteroid injection.

Outcome Measures: Pain and disability as measured by the Patient-Rated Tennis Elbow Evaluation and mechanical hyperalgesia (pressure pain threshold) at 8, 26 and 52 weeks.

Evaluation of physical (cold pain threshold, pain-free grip, cervical spine manual examination) and psychological impairment (kinesiophobia, anxiety and depression) was performed at baseline and analysed for their prognostic capacity after adjustment for treatments.

Results: In the short-term, pain and disability was predicted by cold hyperalgesia (2 weeks, p=0.02) and by baseline scores at all times (p<0.01). Cold hyperalgesia, sex (female) and baseline scores were predictors of greater mechanical hyperalgesia at 8, 26 and 52 weeks (p<0.05), while positive cervical spine manual examination and fear-associated activity avoidance (p=0.02) predicted persistent hyperalgesia at 26 and 52 weeks respectively.

Conclusion: Assessment of cold pain thresholds may be a useful clinical tool to help identify patients at risk of delayed recovery from pain and disability. Cold hyperalgesia, impairment of the cervical spine and kinesiophobia help predict those at risk of persistent elbow hyperalgesia and may provide direction for education-based treatment approaches for these patients.

Trial registration: ACTRN12609000051245.

Funding: National Health and Medical Research Council grant (#S11238); BC is in receipt of a University of Queensland Research Scholarship.

Key Practice Points:
- Cold hyperalgesia predicts delayed recovery of pain and disability in lateral epicondylalgia.
- Cervical spine impairment and fear of movement are associated with delayed recovery.
- Cold hyperalgesia predicts delayed recovery of pain and disability.

PULMONARY REHABILITATION: CAN WE PREDICT WHO RESPONDS IF THE PROGRAM INCLUDES AN EDUCATION COMPONENT?

Blackstock FC1, Webster KE1, McDonald CP2,3, Hill CJ1,4
1Department of Physiotherapy, School of Allied Health, La Trobe University, Melbourne
2Department of Respiratory and Sleep Medicine, Austin Health, Melbourne
3Institute for Breathing and Sleep, Melbourne
4Department of Physiotherapy, Austin Health, Melbourne.

Biography: Ms Felicity Blackstock has recently submitted her PhD at La Trobe University, Melbourne. Felicity is also the Course Coordinator and lecturer in Physiotherapy courses for respiratory disorders at La Trobe University. The results presented in this abstract are reported from the randomised controlled trial comprising the thesis for PhD candidate examining the role of education in pulmonary rehabilitation for people with COPD.

Question: Do baseline characteristics predict which patients respond to pulmonary rehabilitation that includes education and those who respond to an exercise only model?

Design: A parallel group randomised controlled trial with allocation concealment and assessor blinded to group allocation.

Participants: Two hundred and sixty-seven participants with COPD, mean (SD) age 72 (9) years, FEV1 59 (23)% predicted.

Intervention: Eight weeks of twice-weekly supervised pulmonary rehabilitation with COPD disease specific educational activities (ET+ED) or with exercise only (ET).

Outcomes: Response to pulmonary rehabilitation defined as a clinically meaningful change in six minute walk distance or any of the four domains of the chronic respiratory questionnaire measured within 2 weeks of program completion.

Results: A total of 198 participants attended follow up assessment (ET+ED n=113, ET n=85). There were no significant differences between the intervention models in proportion of participants who responded to pulmonary rehabilitation. In the ET +ED group, worse health related quality of life, lower self-efficacy, and poorer psychological state at baseline were associated with greater change in six minute walk distance and chronic respiratory questionnaire score. In the ET group, worse health related quality of life and higher self efficacy at baseline were associated with greater change. However, in binary logistic regression analyses no baseline variables consistently predicted a clinically meaningful response in exercise capacity or quality of life for either model of rehabilitation.

Conclusions: No baseline characteristics have been identified that predict response to pulmonary rehabilitation with or without educational activities; all patients should be offered pulmonary rehabilitation.

Key Practice Points:
- Presently, no baseline characteristics have been identified that predict response to pulmonary rehabilitation.
- No baseline measures have been identified that predict a greater change in 6MWD or QOL following pulmonary rehabilitation with or without education.
- People with COPD should be considered for pulmonary rehabilitation regardless of baseline measures.

PHYSIOTHERAPY DEPARTMENT WORKPLACE CULTURE: CAN YOU MEASURE IT AND IS A WORKPLACE CHARTER USEFUL?

Gilmore L1, Bissett B2
1Physiotherapy Department, Canberra Hospital, Canberra
2School of Physiotherapy, University of Canberra

Questions: How do you measure workplace culture in a physiotherapy department? Is a workplace charter robust and relevant across a three year period in a physiotherapy department?

Design: Retrospective observational study.

Participants: Fifty-one physiotherapists who worked in a single tertiary hospital physiotherapy department between 2009 and 2011(including those who had resigned) were electronically surveyed regarding their experience of workplace culture and usefulness of the workplace charter implemented in 2009.

Outcome Measures: Satisfaction with overall workplace culture and six specific aspects of workplace culture (equity, leadership, valuing strengths and differences, respect, supported learning environment, social dynamic) and perceived departmental values (personal and professional growth, evidence-based practice, quality service principles). Local data was benchmarked with the external organisation-wide culture survey completed in 2012. Qualitative data was collected regarding usefulness and relevance of charter as instituted in 2009.

Results: Of 43 responses (82% response rate) 86% rated overall workplace culture as ‘somewhat positive’ or ‘very positive’. Favours trends were demonstrated across all six aspects of workplace culture and perceived departmental values. The external survey of the physiotherapy department indicated a change from a culture of ‘consolidation’ in 2005 to ‘ambition’ in 2012. Qualitative data indicated the workplace charter remained relevant in 2011 and did not require updating. Respondents suggested the charter be more prominently displayed around the department.

Conclusion: Workplace culture can be measured internally and validated externally. A workplace charter can be both robust and relevant across a 3 year period in a physiotherapy department, despite staff turnover.

Key Practice Points:
- Physiotherapy department workplace culture can be measured internally and validated externally.
- A workplace charter can be useful and remain relevant across several years despite staff turnover.
- Measuring departmental workplace culture and providing feedback to staff can be a rewarding and informative process.
SHOULDER PAIN OVERNIGHT POST STROKE: AN OBSERVATIONAL STUDY

Blennerhassett J, Millet N, Conidaris J.
Royal Talbot Rehabilitation Centre: Austin Health, Melbourne

Questions: How common is overnight shoulder pain during inpatient rehabilitation? Do people with stroke differ to other patient groups regarding overnight shoulder pain, sleep quality and sleeping position?

Design: Behavioural mapping observation and surveys over 3 consecutive nights. Approved by Austin Health’s Human Research Ethics Committee.

Participants: Eighteen people with stroke and a reference group (11 people without restrictions for bed mobility).

Outcome Measures: Survey of sleep quality and shoulder pain. Body and arm posture charted frequently overnight by an independent observer.

Results: One-third of stroke participants reported moderate to severe overnight shoulder pain. This differed to the reference group who did not report shoulder pain (p = 0.03). Sleep disruption was common for various reasons and did not differ between groups (p = 0.25). Four people with stroke were woken due to shoulder pain. Quality of sleep was significantly better for the stroke (p = 0.01). Significantly less change in body (p = 0.02) and arm (p = 0.02) position was observed post-stroke. No awkward arm postures were observed. On average, stroke participants spent 61% of the night on their back, 28% on the unaffected side and 8% on the affected side. The affected arm spent 60% of time by the side and 25% across the body. The reference group spent 32% on the backs, 46% on the right and 15% of the left.

Conclusion: Overnight shoulder pain is common and can interfere with sleep during stroke rehabilitation. People with stroke tended not to move overnight.

Key Practice Points:
• Overnight shoulder pain is common and interrupted sleep in people with stroke.
• People with stroke seldom move overnight.
• Attention is needed to optimise sleep quality and minimise shoulder pain overnight.

NON-PHARMACOLOGICAL AND NON-INVASIVE INTERVENTIONS FOR THE MANAGEMENT OF OSTEOPOROTIC VERTEBRAL FRACTURES: A SYSTEMATIC REVIEW AND META-ANALYSIS

Bolton K, Wallis J
Eastern Health

Question: Do non-pharmacological or non-invasive interventions provide benefit for people with osteoporotic vertebral fractures?

Design: Systematic review with meta-analysis of randomised controlled trials. Standardised mean differences (SMD) were calculated from post intervention scores. The GRADE approach was used to determine the quality of evidence.

Participants: 697 participants from 10 trials, predominantly community dwelling women (mean age of 74 years), with osteoporosis and at least one diagnosed vertebral fracture.

Intervention: Four types of intervention were included: exercise therapy (n=5), multimodal physiotherapy (n=1), bracing (n=2) and electrotherapy (n=2) were identified.

Outcome Measures: Pain, health-related quality of life, impairment (trunk and leg strength, balance, kyphosis angle) and activity limitation were evaluated.

Results: Meta-analysis of five exercise trials, involving 436 participants, provided low quality evidence that exercise interventions led to large increases in trunk extension strength (SMD = 1.15 (95% CI 0.58 to 1.72)). Individual trials of exercise and bracing interventions not included in meta-analysis demonstrated benefit in leg strength, balance and health-related quality of life measures. Spinal bracing from one trial improved pain scores. Electrotherapy improved pain and health-related quality of life.

Conclusion: A small number of randomised controlled trials evaluating exercise, bracing, electrotherapy and multimodal physiotherapy interventions in people with osteoporotic vertebral fractures exist. There is low quality evidence that exercise interventions improve trunk extension strength in people with osteoporotic vertebral fractures, but a lack of evidence to support the interventions of multimodal physiotherapy or electrotherapy for the outcomes of pain, activity limitation and health-related quality of life.

Key Practice Points:
• There is low quality evidence that exercise interventions improve trunk extension strength in people with osteoporotic vertebral fractures.
• Considering significance of the problem limited research on non-pharmacological or non-invasive interventions is available.

SHOES ELEVATE PATELLOFEMORAL JOINT STRESS DURING RUNNING

Bonaccio M, Vicenzino B, Spratford W, Collins P
1 School of Exercise and Nutrition Sciences, Deakin University, Geelong
2 Division of Physiotherapy, The University of Queensland, Brisbane
3 Department of Movement Science, Biomechanics, Australian Institute of Sport, Canberra
4 School of Engineering, Deakin University, Geelong

Question: Does footwear increase patellofemoral joint stress during running?

Design: Randomised, within-participant experimental study.

Participants: Twenty-two (14 male, 8 female) trained distance runners.

Intervention: Participants performed 20 overground running trials in two randomly ordered conditions (10 trials per condition). The two conditions were (i) barefoot; and (ii) a neutral control running shoe. Lower extremity kinematics and ground reaction force data were collected for the stance phase of running and used as input variables into a mathematical model of the patellofemoral joint.

Outcome Measures: Primary outcomes measures were peak patellofemoral joint reaction force and stress during the stance phase of running. Secondary outcome measures were stride length and stride frequency.

Results: Peak patellofemoral joint reaction force was 12% (95% CI 9 to 14) greater during the shod condition compared to barefoot (p < 0.001). Peak patellofemoral joint stress was also 12% (95% CI 9 to 15) greater during the shod condition compared to barefoot (p < 0.001). Stride length was greater (p < 0.001) and stride frequency lower (p < 0.001) during the shod condition compared to barefoot.

Conclusion: Running shod increases patellofemoral joint stress in comparison to running barefoot.

Key Practice Points:
• Running shoes alter stride mechanics and elevate patellofemoral joint loading in comparison to running barefoot.
• Shoe prescription advice may need to be carefully considered in runners suffering from patellofemoral joint overload.
• Those suffering from patellofemoral joint overload may benefit from removing their shoes during running.

EARLY PROPRIOCEPTION AND NEUROMUSCULAR EDUCATION POST ANTERIOR CRUCIATE LIGAMENT AUTOGRAFT REVISION YIELDS ANALOGOUS RESULTS VERSUS TRADITIONAL REHABILITATION IN PROFESSIONAL ATHLETE

Bongiorno LE, Jolly KJ, Grierson JW

Question: Does implementation of early proprioceptive training, dual-tasks, and neuromuscular education, with delayed progressive resistive strength training affect muscle mass, strength, confidence, and return to play in anterior cruciate ligament autograft revision?

Design: A retrospective single subject case study.

Participant: 25 year-old professional soccer player with revised anterior cruciate ligament patellar graft surgery following unsuccessful hamstring graft repair and traditional rehabilitation model.

Intervention: Emphasis on neuromuscular education, dual-tasks, early proprioceptive, and lumbopelvic stability training, employing Pilates and proprioceptive neuromuscular facilitation techniques. Sport psychology interventions such as visualization and motor imagery were utilized with specific auditory cues during gait and functional training. Traditional knee strengthening was understated and delayed.
**Outcome Measures:** Return to professional soccer, isometric strength, muscle mass, and psychological readiness to return to sport questionnaire.

**Results:** At 5½ months post-op an equal muscle mass on both legs was found. Measured at 30° of knee flexion, right isometric knee extension and flexor strength were 72% and 90% with reference to uninjured limb, respectively. At 7½ months the patient scored 59.5/60 on the psychological readiness to return to sport questionnaire and successfully returned to elite professional competition.

**Conclusion:** Subject displayed equal muscle mass, appropriate psychological readiness, and a successful return to professional competition with a novel integrative approach to rehabilitation with delayed focus on traditional progressive resistive strength training following anterior cruciate ligament revision. High-level evidence studies with larger sample sizes and prospective designs are required to validate the use of an integrative approach to anterior cruciate ligament revision.

**Key Practice Points:**

- Integration of early proprioception, dual-tasks, and neuromuscular education may lead to optimal outcomes in anterior cruciate ligament revision
- Early emphasis on knee strength in anterior cruciate ligament revision was not required in this case for optimal outcomes
- Further high quality evidence is needed in this study area

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**PHYSICAL ACTIVITY AND LOWER LIMB MUSCLE MASS WITHIN SIX MONTHS OF STROKE: AN OBSERVATIONAL STUDY**

**Borschmann K**, Iuliano S, Pang MYC, Churilov L, Bernhardt J.

1Latrobe University, Bundoora
2Florey Neuroscience Institutes, Heidelberg
3Department of Medicine—Austin Health, University of Melbourne, Heidelberg
4Endocrine Centre, Austin Health, Heidelberg
5Department of Rehabilitation Sciences, Hong Kong Polytechnic University, Hong Kong

**Questions:** What proportion of time is spent supine, sitting, and standing and walking within two weeks and six months of stroke? Does leg muscle mass decline within this period? Is there an association between activity after stroke and change in muscle mass?

**Design:** Observational study.

**Participants:** Twenty-one adults (mean age 69.2±12.4yrs, 38% female) hospitalised with stable stroke, but not independently mobile.

**Outcome Measures:** Assessed within two weeks and six months of stroke: time in each position and number of sit-to-stand movements, measured 8am – 5pm using Positional Activity Logger device (PAL2). Muscle mass of paretic and non-paretic legs using DXA. Mobility status recorded at one and three months.

**Results:** Proportion of time spent in each position differed from baseline to six months: lying 59.0±27.2% v 15.9±26.3%, sitting 34.3±23.2% v 61.1±28.2%, standing 6.7±10.4% v 14.7±18.8%, and number of sit-to-stands: median (IQR) 4 (2-17) v 26 (11-39) (all p < 0.05). No changes were observed for muscle mass at either the paretic -0.7±7.5% (p = 0.75), or non-paretic legs 1.4± 8.0% (p = 0.57) and no association was observed between activity levels and muscle mass of legs. However, only 14 patients were independently mobile by six-months and an association was observed between inability to walk independently at three months and loss of paretic leg muscle (r = -0.44, p = 0.05).

**Conclusions:** Physical activity was limited up to six-months after stroke, even in people who regained independent mobility. Re-establishing walking after stroke may help preserve muscle mass in paretic limbs.

**Key Practice Points:**

- People are not active in the first six months of stroke.
- Loss of muscle mass is associated with the development of osteoporosis and fracture risk, cardiovascular deconditioning and independence with daily activity.
- Regaining of independent mobility early after stroke may help to reduce loss of muscle mass in paretic limbs.

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**EARLY INTENSIVE PHYSICAL REHABILITATION IS POSSIBLE IN THE BARIATRIC STROKE PATIENT...A CASE STUDY**

**Bowater GA, Cormack LM**

Physiotherapy Department, Sir Charles Gairdner Hospital, Perth

**Question:** How do we provide early intensive physical rehabilitation in a bariatric stroke patient? What additional resources are required?

**Design:** Single case study with prospective data collection, prospective video and photography and retrospective notes audit.

**Participants:** One 34 year old woman with severe stroke who weighed 250kg and had a BMI of 81 on initial presentation to hospital.

**Outcome Measures:** Time spent in physiotherapy and the number of sessions of physiotherapy were recorded over her admission. The Mobility Scale for Acute Stroke (MSAS) was measured weekly and the Impairment Inventory of the Chedoke McMaster Stroke Assessment (CMSA) for arm and hand was administered on admission, once during admission and on discharge.

**Results:** The patient received 125 hours of Physiotherapy delivered over 32 sessions mostly by 4 physiotherapists at a time. Her initial MSAS was 6 and on discharge was 24. Initially the CMSA Impairment Inventory measured stage 3 (arm and hand) and on discharge, stage 4 (arm) and stage 6 (hand). Utilisation of the complex case management Physiotherapy team contributed significantly to the effective delivery. Physiotherapy sessions utilised all available bariatric equipment, often in combination, including tilt table, standing frame, ceiling hoist and walking aids. A considered approach was required to maintain staff and patient safety, whilst also allowing active contribution from the patient. Important aspects of this approach will be discussed.

**Conclusion:** This case highlights that early, intensive rehabilitation is possible despite the challenges of the bariatric patient, and that excellent outcomes can be achieved in this population.

**Key Practice Points:**

- Early intensive physical rehabilitation is possible in the bariatric stroke patient
- Additional resources such as the complex case management Physiotherapy team and specialist bariatric equipment make early physical rehabilitation safe and effective
- Excellent outcomes can be achieved with early physical rehabilitation in bariatric stroke patients

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**FIBROTIC CONTRACTURE OF INFRASPINATUS IN CANINES**

**Bowen AG**

**Question:** Could physiotherapy prevent fibrotic contracture of infraspinatus in canines?

**Design:** Summary from the literature. Clinical presentation: Sudden onset of lameness during sport which resolves over two weeks, but by four weeks a characteristic gait abnormality emerges. Palpation and joint assessment aid differential diagnosis from other shoulder conditions.

**Veterinary Intervention:** Current literature recommends early surgical intervention of supra/infraspinatus tenotomy +/- joint capsule resection. Physiotherapy

**Intervention:** Post-surgical rehabilitation may include passive movements, ultrasound/laser/electrotherapy, then stretching, massage, therapeutic exercise targeting shoulder stability and graduated return to sport. There are no studies on physiotherapy as a non-surgical alternative; however there is human and animal evidence from other conditions that early physiotherapy can influence healing and remodelling of soft tissues potentially preventing fibrotic contracture. Physiotherapists also have a role educating owners/clubs to: 1) provide their canines with adequate warm-up which may prevent injuries and 2) to seek veterinary/physiotherapy opinion as soon as possible after an injury even if lameness is only transient.

**Conclusion:** Physiotherapy definitely has a role in post-surgical rehabilitation for this condition. If presented in the acute or subacute phases of injury physiotherapy could potentially prevent fibrotic contracture from occurring.
**Key Practice Points:**

- Fibrotic contracture of infraspinatus is an uncommon condition seen in sporting canines following acute shoulder injury.
- Post-surgical physiotherapy would optimise functional outcomes.
- If presented in the acute or subacute phases of injury physiotherapy could potentially prevent fibrotic contracture from occurring.

**References:**


**Clinical Feasibility of the Nintendo Wii for Balance Training Post-Stroke: A Pilot Randomised Controlled Trial in an Inpatient Rehabilitation Setting**

**Bowen KJ**<sup>1</sup>, **Clark RA**<sup>1</sup>, **McGinley JL**<sup>2</sup>, **Martin CL**<sup>3</sup>, **Miller KJ**<sup>4</sup>

1Department of Physiotherapy, Melbourne School of Health Sciences, The University of Melbourne, Melbourne

2Department of Physiotherapy, The Royal Melbourne Hospital – Royal Park Campus, Melbourne Health, Melbourne

3School of Exercise Science, Australian Catholic University, Melbourne

4Institute for Safety, Compensation and Recovery Research, Monash University, Melbourne

5Department of Physical Therapy, University of British Columbia, Vancouver, Canada

**Question:** Is the Nintendo Wii a clinically feasible tool to enhance standing balance after stroke in an inpatient rehabilitation setting?

**Design:** Single blind pilot randomised controlled trial

**Participants:** Thirty adults undertaking inpatient stroke rehabilitation.

**Intervention:** Participants were allocated to a Balance Group (intervention), using the ‘Wii Fit Plus’ in standing, or Upper Limb Group (active control), using the ‘Wii Sports / Sports Resort’ in sitting, undertaking three 45 minute sessions per week for up to four weeks additional to standard therapy.

**Outcome Measures:** The primary outcome was feasibility evaluated by retention, adherence, acceptability and safety. The primary clinical outcomes, assessed at baseline, two and four weeks, were the Step Test and Functional Reach. Secondary outcomes included mobility, upper limb function and Wii Balance Board-derived centre of pressure data.

**Results:** Attainment was 10% at two weeks rising to 30% at four weeks due to early discharge. High adherence was observed (>99% sessions at two weeks, 87% at four weeks due to early discharge). Participants reported sessions were enjoyable (100%). All Balance Group and 77% of Upper Limb group participants felt the sessions were beneficial to their rehabilitation. There were no major adverse safety events. Change scores and effect sizes indicated that the balance intervention was associated with positive trends of improved balance.

**Conclusion:** A Nintendo Wii-based intervention shows promise as a feasible and safe option to improve standing balance in people undergoing inpatient rehabilitation after stroke. Further investigation of the efficacy of this approach through a larger clinical trial is warranted.

**Key Practice Points:**

- A Nintendo Wii intervention appears to be feasible and safe for people undergoing inpatient rehabilitation following stroke
- A ‘Wii Fit Plus’ balance training protocol shows promise for improving balance-related outcomes after stroke
- A larger more definitive trial is needed to further determine efficacy of this treatment approach
**DOES A 4-WEEK DUAL-TASK WALKING TRAINING PROGRAM IN PEOPLE WITH PARKINSON’S DISEASE IMPROVE ACTUAL MOBILITY LEVELS?**

**Brauer S1, Lamont R1, Woollacott M2, Morris M3**

1The University of Queensland
2The University of Otago
3LaTrobe University

**Question:** Does participation in a 4-week intensive dual-task walking training program improve actual mobility in people with Parkinson’s disease (PD)?

**Design:** Parallel-group randomised clinical trial with concealed allocation, assessor blinding and intention-to-treat analysis.

**Participants:** Sixty-three people with idiopathic PD and gait hypokinesia.

**Intervention:** The experimental group performed a 4-week dual task walking training program with progressed gait and concurrent adductor training. The control group performed a 4-week walking training program with progressed gait tasks.

**Outcome Measures:** Actual mobility, a secondary outcome measure, was measured using an ActiPValTM accelerometer for three days at baseline, 1, 2, post and 6 months follow up.

**Results:** Overall, generalised linear models found no group, time or group by time interactions for the average number of steps/day. Participants performed approximately 4200 ± 2700 steps/day (range 753-13,051), with this increasing on average by 400 steps post training. There was a group x time interaction (p = 0.046) for those who did <4000 steps/day at baseline to increase their average number of steps after dual tasking (from 2420 to 3920 steps) and remain above baseline levels at follow up (2800), whereas those in the single task walking training group remained the same (2590 to 2560 to 2650 steps).

**Conclusions:** A one-on-one, individualised program of dual task walking training had its greatest effect on increasing steps taken daily by people with PD who walked little at baseline. A wide variation in mobility level was likely to contribute to the little change in actual mobility across the whole cohort.

**Key Practice Points:**
- Participation in a 4-week one-on-one walking training program did not result in significant changes in actual mobility in people with PD immediately and at six months post training.
- Dual task walking training had greatest effect on those who walked little at baseline.

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**THE EFFECT OF POOL TEMPERATURE ON BODY TEMPERATURE DURING AQUA-AEROBIC EXERCISE IN PREGNANCY**

**Brearley A**

**Aquamums Pty Ltd**

**Question:** Medical guidelines encourage women to exercise during pregnancy but not to overheat. Therefore many pregnant women choose to exercise in water. However, the temperature of the water may affect body temperature response to exercise. The aim of this study was to examine this response to a range of water temperatures found in community swimming pools in which women are exercising and to obtain data to inform guidelines for appropriate water temperatures when pregnant women are undertaking aqua-aerobic exercise.

**Participants:** 109 women in the second and third trimester of pregnancy who were enrolled in a pre-natal aqua-aerobics class.

**Intervention:** Tympanic temperature was measured at rest pre-immersion (T1), after 35 minutes of moderate intensity aqua-aerobic exercise (T2), after a further 10 minutes of light exercise and stretching while still in the water (T3) and finally on departure from the facility (T4). The range of water temperatures in seven community pools used in the study was from 28.8°C to 33.4°C.

**Results:** Body temperature increased by mean 0.16°C (SD 0.35) at T2, was maintained at this level at T3 and had returned to pre-immersion resting values at T4. Regression analysis demonstrated that the temperature response was not related to the temperature of the water. The participants were grouped according to water temperature and analysis of variance demonstrated no difference in body temperature response between the cooler, medium and warmer water temperature groups.

**Conclusion:** Healthy pregnant women maintain body temperatures within safe limits during moderate intensity aqua-aerobic exercise conducted in pools that are heated up to 32°C and probably up to 33°C.

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**DIGITAL PHOTOGRAPHY IS RELIABLE FOR SHOULDER RANGE OF MOTION MEASUREMENT**

**Breckenridge JD2, Hirschhorn AD2, Acosta NM3**

1Central West Orthopaedic and Sports Physiotherapy, Sydney
2The Clinical Research Institute, Sydney
3The University of Kentucky, Lexington

**Question:** Is digital photography reliable as a measurement tool for shoulder range of motion?

**Design:** Experimental cross-sectional study.

**Participants:** Thirty healthy adults.

**Outcome Measures:** Digital photographs were taken of each participant’s right shoulder/upper limb in ten randomly assigned joint positions between 0° and 180° of flexion. Positions were set by a physiotherapist and physiotherapy student with a goniometer and plumb line. A blinded assessor subsequently calculated shoulder flexion range of motion from printed photographs on two separate occasions, using a protractor.

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**WILL COMPUTER GAMES REVOLUTIONISE PHYSICAL REHABILITATION AFTER STROKE? INVESTIGATING THE CLINICAL FEASIBILITY OF A SUITE OF CUSTOM-DESIGNED GAMES**

**Bower K1,2, Louie J1, Bernhardt J2**

1Melbourne Health, Melbourne
2Florey Institute of Neuroscience and Mental Health, Melbourne

**Question:** Can a suite of four customised computer games utilising a motion-sensing camera be feasible for use in stroke rehabilitation?

**Design:** Feasibility study.

**Participants:** Forty adults with stroke able to sit unsupported for greater than 10 seconds were consecutively recruited from inpatient and outpatient services at a Melbourne rehabilitation facility.

**Intervention:** Each participant was randomly assigned to trial one of the gaming activities. During a single session participants worked through 10 levels of difficulty of the allocated game both in sitting and standing positions.

**Outcome Measures:** Feasibility addressed willingness to participate, adherence to protocol, acceptability (enjoyment, perceived helpfulness, willingness to continue) and safety.

**Results:** Forty participants (mean age 63.1 years, 67.5% male) of 89 screened were recruited. 85% of those deemed eligible agreed to take part in the study. The time since stroke ranged from 6 days to 4 years (median 38.5 days) and participants presented with a broad range of functional disabilities. All participants attended the sessions (mean 33.6 minutes) and 58% completed the full sitting and standing protocol. Those with more severe stroke completed lesser levels of difficulty due to factors such as functional limitation and fatigue. The majority of participants found the intervention to be enjoyable (92.5%), helpful (80%), and something they would like to continue as part of their therapy (87.5%). There were no falls or serious adverse events requiring medical attention during the sessions.

**Conclusion:** Preliminary analyses indicate that the gaming intervention is feasible and safe to use in a stroke population.

**Key Practice Points:**
- Gaming activities using a motion-sensing camera, show promise for being a feasible and safe intervention in stroke rehabilitation.
- These games appear to be suitable for use across a broad spectrum of people with stroke.
- Further research is required to determine the effectiveness of this intervention type on functional outcomes.
Results: There was a significant and very strong correlation between goniometer and photograph range of motion ($R = 0.997$, $p < 0.001$). Photograph range of motion was significantly higher than goniometer range-of-motion (mean difference: 2.1°, 95% CI: 1.8° to 2.4°). There was a significant and very strong correlation between repeated photograph ranges-of-motion ($R = 0.999$, $p < 0.001$).

Conclusions: Shoulder range of motion as measured with digital photography correlates very strongly with live goniometry, and demonstrates excellent intra-rater reliability. Given the ubiquity of smart-phone cameras, digital photography is readily accessible in the clinic. Physiotherapists should consider the use of digital photography to measure/document changes in patients’ shoulder range of motion over time and with therapeutic intervention.

Key Practice Points:
- Digital photography can be used to measure shoulder range-of-motion accurately and reliably
- The use of digital photography in the clinic may facilitate/improve documentation of care for the patient with shoulder range of motion restriction.

THE LEFT/RIGHT JUDGEMENT TASK IN PEOPLE WITH & WITHOUT SHOULDER PAIN: A PILOT STUDY  
Breckenridge JD², Ginn KA¹, McAuley JH²,³
¹The University of Sydney, Sydney  
²The Clinical Research Institute, Sydney  
³Neuroscience Research Australia, Sydney

Question: What is the accuracy and response times for the shoulder left/right judgement task in people with and without shoulder pain?

Design: Experimental cross-sectional study.

Participants: Thirty participants with chronic shoulder pain, 30 healthy adult control participants.

Intervention: Participants were administered the shoulder left/right judgement task (LRJT) via a custom set of 32 randomly shuffled cards. Each card consisted of a digital photographic image of the entire upper limb in a variety of postures. Subjects were instructed to view each card and determine whether a left or right image, as quickly and accurately as possible.

Outcome Measures: The response times and accuracy for the task were recorded.

Results: Mean response time for participants with shoulder pain was 4.3 seconds per image (95%CI, 3.8 to 4.9 seconds) which was significantly slower than healthy control participants (2.7 seconds per image, 95%CI, 2.5 – 2.9 seconds). (F1,58 = 38.13, $P < 0.001$). Mean accuracy of participants with shoulder pain was 78% (95%CI, 72 to 83%) compared to 95% accuracy for control participants (95%CI, 92 – 97%). (F1,58 = 31.38, $P < 0.001$)

Conclusions: This pilot study demonstrated that subjects with shoulder pain are both significantly slower and less accurate than normal healthy people at the shoulder LRJT. We demonstrated that upper limb images, when used for the LRJT, were able to detect a difference in participants with shoulder pain. This data provides good evidence for further exploring the shoulder LRJT in a larger, more robust study.

Key Practice Points:
- People with shoulder pain are both significantly slower and less accurate than normal healthy people at the shoulder LRJT.
- Card based delivery of shoulder images is an acceptable form of the LRJT for use in the clinic
- A larger more robust study addressing this pilot study limitations is warranted.

MANAGING PELVIC GIRDLE PAIN AND LOW BACK PAIN BY IMPROVING PELVIC LOAD TRANSFER USING KINESIO TAPE  
Bridges T
PhysioWISE

Question: Can treatment options be offered in order to reduce the load transfer through the pelvis as measured by the active straight leg raise test?

Design: Baseline measurements for perceived effort during the active straight leg raise were recorded. Testing was repeated with therapist-supplemented stabilisation strategies across the pelvic girdle. Kinesio tape was applied in priority order to facilitate those stabilisation strategies that improved effort. The new effort was recorded with each intervention.

Participants: Patients with pelvic girdle pain or low back pain.

Intervention: Therapist-supplemented manual compressions were used to determine the fascial chains that provided the most significant improvement in effort during the active straight leg raise test. Kinesio Tape was then applied using the protocols described by the Kinesio Taping Method.

Outcome Measures: Effect of the Kinesio Taping application on the effort reported through the active straight leg raise test.

Results: There were 17 valid participants with a total of 29 limbs testing positive for perceived effort. 25 of the 29 test limbs were reported by the subjects as having improved the perceived effort after a single Kinesio Taping intervention. This included 13 which reported zero effort. All 29 test limbs were reported by the subjects as having improved by the third Kinesio Taping intervention. This included 21 which reported equal or better scores than that provided by the therapist-supplemented tests.

Conclusion: With the appropriate assessment, Kinesio Taping can be used to reduce the load transfer through the pelvis as indicated by the active straight leg raise test.

Key Practice Points:
- Kinesio Tape may be useful in the management of pelvic girdle pain and low back pain.
- Kinesio Tape may promote better mechanical loading and decrease symptoms and effort during pelvic girdle load transfer.
- Additional research is required to improve the level and standard of this evidence.

INVESTIGATING THE EFFICACY OF INDIVIDUALISED INTERVENTIONS BASED ON THE BOBATH CONCEPT  
Brock K

Many of the interventions we use in neurological rehabilitation are complex, multi modal and tailored to the presentation of the individual patient. In the clinical reasoning process, relative contributions of specific deficits in neurological and neuromuscular functions (for example, motor control, perception, motor planning, biomechanical changes) are evaluated in the performance of tasks, and interventions are delivered on the basis of these findings. A multi modal approach utilising different types of therapeutic input may be required to achieve a measurable change in a specific function. These issues are not specific to neurological physiotherapy; they are shared by many disciplines and are recognised in the research literature. The CONSORT1 group has developed guidelines for non pharmalogical trials including trials in surgery, psychotherapy and rehabilitation. The guidelines are designed for research into “complex interventions involving several components” where interventions are “difficult to describe, standardise, reproduce and administer consistently”. The Bobath concept takes a holistic approach. For example, interventions aimed at improving reach and grasp may include optimising alignment and postural muscle activity at the pelvis and thorax to enhance control of the upper limb. The Bobath concept utilises manual handling (facilitation) that is responsive to the individual’s body alignment and patterns of muscle activation at that moment in time. Facilitation is, by definition, not able to be standardised. This presentation will discuss how these issues are being addressed in clinical trials conducted by our centre investigating the efficacy of the Bobath concept.

UPDATING THE EVIDENCE FOR MANAGEMENT OF OSTEOARTHRITIS & RHEUMATOID ARTHRITIS

Brosseau L1, Rahman P1, Toupin April K1, Poitras S1, King J1, De Angelis G1, Loew L1, Smith C1, Casimiro L1, Paterson G2, McEwan J1

1University of Ottawa, School of Rehabilitation Sciences, Ottawa, Canada
2The Arthritis Society, Ottawa, Canada

Question: The objectives of the review were: to assess the quality of the clinical practice guidelines on non-pharmacological management of osteoarthritis and rheumatoid arthritis using the Appraisal of Guidelines Research and Evaluation (AGREE II) tool and to summarize the recommendations based on only high-quality existing clinical practice guidelines.

Design: A systematic review in a narrative format synthesising data from existing guidelines. Two pairs of evaluators were trained to assess the guidelines. A reliability study using intraclass correlation coefficients (ICC) was performed on the subtotal scores for each of the six AGREE II domains. Ethics approval was not required for this review. Clinical Practice Guidelines: A systematic search of scientific literature databases from 2001 to 2013 for evidence identified 17 guidelines for osteoarthritis and 12 for rheumatoid arthritis.

Intervention: Only the recommendations on non-pharmacological interventions were considered.

Outcome Measures: The AGREE II instrument was used to appraise all 29 included guidelines.

Results: All guidelines effectively addressed a minority of AGREE II domains. The overall quality of the included guidelines, according to the 7-point AGREE II scoring system, is 5.1 ± 0.27 for rheumatoid arthritis and 5 ± 0.41 for osteoarthritis. Therapeutic exercises, patient education, Transcutaneous Electrical Nerve Stimulation, and weight control are commonly recommended by the high-quality guideline. The two evaluators had intraclass correlation coefficients ranging from 0.85 (good) to 0.95 (high).

Conclusion: Non-pharmacological interventions were superficially addressed in more than half of the guidelines. Thus, guidelines creators should use the AGREE II criteria when developing guidelines.

Key Practice Points:
• Clinicians should refer to guidelines that are deemed high quality based on an assessment using the AGREE II tool.
• Existing guidelines exhibit some common recommendations about therapeutic exercise, patient education, Transcutaneous Electrical Nerve Stimulation, and weight control.

THE USE OF THE KNOWLEDGE-TO-ACTION CYCLE MODEL TO IMPLEMENT THE OTTAWA PANEL CLINICAL PRACTICE GUIDELINES

Brosseau L1, Wells GA1, Brooks S1, Bell M1, Tugwell P1, Kenny GP2, De Angelis G1, Loew L1

1University of Ottawa, School of Rehabilitation Sciences, Ottawa, Canada
2The Arthritis Society, Toronto, Canada

Question: What are the best multifaceted strategies to implement the Ottawa Panel guidelines using the Canadian Implementation Model called the Knowledge-To-Action Cycle?

Design: Between 2006 and 2012, four implementation studies including randomised controlled trials were conducted to facilitate the adoption of self-management interventions to rheumatoid arthritis and osteoarthritis.

Participants: Over 500 arthritic individuals participated to examine the efficacy/feasibility of various implementation strategies to facilitate the adoption of effective self-management interventions including walking programs, Tai Chi, therapeutic exercises etc. Ethics approval was obtained for all trials.

Interventions: The intervention group used affordable technologies like social media or existing low-cost community-based resources such as walking clubs. The control group received ‘usual care’ and a booklet of general age-appropriate activities.

Outcome Measures: Movement Assessment Battery for Children-2, single leg stand, lateral reach and standing long jump. All children were assessed pre-commencement of the intervention and then within one month of program completion.

Results: 42 of 44 children completed assessments. There were no significant differences between groups on any measure at baseline. Post-intervention analysis shows significant gains on more measures within the intervention group than the control group, but no significant pre-post changes between groups.

Conclusion: Advice coupled with parental compliance appears to be beneficial in four-year-old children with a history of extreme prematurity or extremely low birth weight.

Key Practice Points:
• Adequate home program. The control group received ‘usual care’ and a booklet of general age-appropriate activities.
• Small group physiotherapy intervention is recommended as the study progressed.
• The use of affordable technologies like social media or existing low-cost community-based resources such as walking clubs is promising to implement guidelines amongst patients and physiotherapists.

MOTOR CO-ORDINATION AND POSTURAL STABILITY OF EXTREMELY LOW BIRTH WEIGHT PRESCHOOL CHILDREN FOLLOWING PHYSIOTHERAPY INTERVENTION: A RANDOMISED CONTROLLED TRIAL

Brown L1,2, Burns Y1,2, Watter P1, Gray P1

1Growth & Development Research Unit, Mater Health Services, Brisbane
2The University of Queensland, Brisbane

Question: What is the effect of small group physiotherapy intervention compared to usual advice on motor co-ordination and postural stability in able-bodied preschool children with a history of extreme prematurity or extremely low birth weight?

Design: Randomised Controlled Trial with concealed allocation and assessor blinding.

Participants: 44 four-year-old children born < 1,000g and/or < 28 weeks gestational age, and managed at the Mater Mothers’ Hospital, Brisbane and who: scored 9-12 on the Neurosensory Motor Developmental Assessment > 70 on the Stanford Binet test of IQ at four years corrected age; had not started preparatory school; had no major impairments.

Intervention: The intervention group completed six one-hour weekly structured sessions addressing co-ordination, postural control, individual movement difficulties, and a goal-focused home program. The control group received ‘usual care’ and a booklet of general age-appropriate activities.

Outcome Measures: Movement Assessment Battery for Children-2, single leg stand, lateral reach and standing long jump. All children were assessed pre-commencement of the intervention and then within one month of program completion.

Results: 42 of 44 children completed assessments. There were no significant differences between groups on any measure at baseline. Pre-post intervention analysis shows significant gains on more measures within the intervention group than the control group, but no significant pre-post changes between groups.

Conclusion: Advice coupled with parental compliance appears to be beneficial in four-year-old children with a history of extreme prematurity or extremely low birth weight, although for optimal outcomes, intervention is recommended.

Key Practice Points:
• Able-bodied preschool children born extremely preterm/with extremely low birth weight may have mild motor problems and reduced postural stability.
• Small group physiotherapy intervention is recommended to optimise the physical performance of this population before school.
• Important to investigate if long-term benefits of intervention in this population.

Results: After 3 months, participants were more compliant in the intervention group compared to the self-directed group (p < 0.012). Knowledge acquisition scores improved among participants with a mean difference of 1.8 (p = 0.01) when compared from baseline to immediate post-intervention. Self-efficacy towards self-management interventions was maintained from immediate post-intervention to three months follow-up, and confidence improved as the study progressed.

Conclusion: The strategies used in the four studies were effective in improving program adherence, knowledge acquisition, and self-efficacy months later. The Knowledge-To-Action Cycle provided milestones to conduct these implementation studies. Trials registration: IRCTN09193542 & IRCTN15081241

Key Practice Points:
• Knowledge-To-Action Cycle model facilitates the design of implementation randomized controlled trials to favour the adoption of effective interventions directly to patients or physiotherapists.
• The use of affordable technologies like social media or existing low-cost community-based resources such as walking clubs is promising to implement guidelines amongst patients and physiotherapists.
FAMILY-SUPERVISED EXERCISE PROGRAMS FOR IMPROVING PHYSICAL FUNCTION OF NEUROLOGICAL INPATIENTS: A SYSTEMATIC REVIEW

Brunner GL, Fried CE, Mackintosh SM, Hillier SL
School of Health Sciences, University of South Australia, Adelaide

Question: Do therapist-devised, family-supervised exercise programs improve the physical function of adult inpatients with neurological conditions?

Design: Systematic review of randomised and non-randomised controlled trials.

Participants: Adult inpatients with a neurological condition and their family members.

Intervention: Physical activity exercises targeting specific impairments or activity limitations, conducted regularly under the supervision of family members.

Outcome Measures: Validated measures of physical function, carer burden and health service outcomes.

Results: Six trials met the inclusion criteria: one randomised and five non-randomised. All participants (n = 270) were inpatients with stroke. All trials reported positive intervention effects at least one physical function outcome. Three studies also reported non-significant results for some outcomes. Only two trials had the same outcome measure (Barthel Index) and provided data that could be included in a meta-analysis, which showed a positive effect on physical function (MD 14.12, 95% CI 5.16-23.08). Only one study reported on carer burden and this decreased with the intervention. Three studies that investigated health service outcomes reported positive effects on length of stay and discharge destination. Results should be viewed with caution as only two trials allocated participants based on whether there were family members available to assist with an exercise program.

Conclusion: The effectiveness of family-supervised exercise in rehabilitation inpatient settings is uncertain due to the lack of high quality evidence available but they may benefit the physical function of adults with neurological conditions as well as benefitting their family members.

Key Practice Points:
• Family-supervised exercise programs may increase physical function for adults after stroke.
• Family-supervised exercise programs may benefit carers.
• High quality evidence is needed to establish the effectiveness of family-supervised exercise programs for improving physical function in different groups of neurological inpatients.

A PILOT INVESTIGATION OF THERAPIST-DEVISED, FAMILY-SUPERVISED EXERCISE PROGRAMS TO IMPROVE PHYSICAL FUNCTION FOR INPATIENT ADULTS WITH ACQUIRED BRAIN INJURY

Brunner GL1, Fried CE1, Mackintosh SM1, Hillier SL1, Killington MJ1,2,3
1School of Health Sciences, University of South Australia, Adelaide
2SA Brain Injury Rehabilitation Services, Hampstead
3Department of Rehabilitation and Aging, Repatriation General Hospital, Daw Park

Question: Do therapist-devised exercise programs conducted by family members in addition to usual care, improve physical function in adults with acquired brain injury compared to usual care alone?

Design: Single blinded, pilot randomised controlled trial.

Participants: Ten adult inpatients with an acquired brain injury and their family members.

Intervention: The intervention group completed an exercise program, based on physical function goals and devised by a physiotherapist, at least three times weekly for four weeks supervised by a family member. The control group received usual inpatient rehabilitation care.

Outcome Measures: The primary outcome was physical function measured by the Clinical Outcomes Variable Scale. Secondary outcomes were family member satisfaction with care (modified Critical Care Family Satisfaction Survey) and family member mood (The Center for Epidemiologic Studies Depression Scale). Measures were taken at baseline and six weeks follow up. Feedback on the intervention was sought from family members using a structured survey at six weeks follow up.

Results: Randomisation has not yet been broken for all participants; this will occur in four weeks’ time and outcome results will be presented at the conference. Preliminary feedback from family members has been positive however fewer potential participants than expected had family members available or willing to participate in the study.

Conclusion: The successful use of therapist-devised, family-supervised exercise programs during inpatient rehabilitation is constrained by availability of family members. Further conclusions will be made based on the results of the study and will be discussed at the conference.

Trial registration: ACTRN12612000972820

Key Practice Points:
• The availability of family members is a limiting factor on the successful inclusion of therapist-devised family-supervised exercise programs in the rehabilitation of adults with acquired brain injury.
• Further practice points will be discussed at the conference based on results of the study.

“M JUST SCARED OF THE PAIN. A QUALITATIVE INVESTIGATION OF AVOIDANCE BEHAVIOUR IN CHRONIC LOW BACK PAIN

Bunzli S1, Smith A2, Watkins R2, Schütze R3, O’Sullivan P4
1School of Physiotherapy, Curtin University, Perth
2Telethon Institute for Child Health Research, Centre for Child Health Research, The University of Western Australia, Perth
3Wisdom Health Pty Ltd, Perth

Question: What drives avoidance behaviour in people with chronic nonspecific low back pain and high pain related fear?

Design: A primary qualitative methodology involving semi-structured in-depth interviews. A secondary mixed methods analysis was incorporated when emergent qualitative findings identified an opportunity to lend construct validity to subscales of the Tampa Scale of Kinesiophobia.

Participants: Thirty-five adults with nonspecific low back pain ≥6 months and high pain related fear (≥42 Tampa Scale of Kinesiophobia).

Results: Two main drivers of avoidance behaviour emerged inductively from the qualitative interviews. ‘Fear avoidance’ describes the avoidance of pain believed to be a sign of damage. ‘Pain avoidance’ describes the avoidance of pain due to its aversive nature and impact on function. Non-parametric tests showed individuals with ‘Fear avoidance’ beliefs (n = 18) scored significantly higher on the Somatic Focus subscale of the Tampa Scale of Kinesiophobia than individuals who did not endorse ‘Fear avoidance’ beliefs (n = 17) (p = 0.01). No significant differences were seen between groups on the Activity Avoidance subscale.

Conclusion: ‘Fear avoidance’ beliefs support predictions made by the Fear Avoidance Model of chronic pain. ‘Pain avoidance’ beliefs highlight the need for a new working model of fear-avoidance and associated disability. By adopting a mixed methods approach, the qualitative findings lent validity to the existence of a Tampa Scale of Kinesiophobia Somatic Focus subscale but question the ability of the Scale to discriminate between fearful and non-fearful avoidance behaviour. Ethics approval was granted by Curtin University (HRBS_2011).

Key Practice Points:
• The belief that pain signals damage drives avoidance behaviour in some individuals with chronic low back pain.
• A significant proportion of individuals with high pain related fear do not believe pain signals damage.
• The aversive nature of pain and its impact on function also drive avoidance behaviour in this population.
THE PROCESS OF CHANGE: A QUALITATIVE STUDY INVESTIGATING PATIENT PATHWAYS THROUGH COGNITIVE FUNCTIONAL THERAPY FOR CHRONIC LOW BACK PAIN

McEvoy S, Bunzlitz S, O’Sullivan P, Dankaerts W, O’Sullivan K
1 Department of Clinical Therapies, University of Limerick, Limerick, Ireland
2 Department of Rehabilitation Sciences, University of Leuven, Leuven, Belgium

Question: What are the key elements in achieving a successful clinical outcome in people with chronic low back pain undergoing Classification Based – Cognitive Functional Therapy?

Design: This study was set in Ireland and Australia. Fourteen individual semi-structured interviews were conducted with participants four to six months following a CB-CFT intervention for chronic low back pain. Purposive sampling was employed to select a sample of Responders and Non-responders based on disability data. Theoretical sampling was employed to challenge emerging themes. Transcripts were independently analysed using an Interpretive Description paradigm by two investigators blinded to responder status.

Results: Three groups emerged through the analysis: Responders, Non-Responders and Unclear Responders. Two main themes were identified: ‘Changing Pain Beliefs’ required the provision of a new perspective, an understanding of contributors to pain and the evolution of mindfulness. This was facilitated by a close patient-therapist relationship, active reflection and experiencing pain control. In Responders and Unclear Responders this was associated with developing biopsychosocial beliefs, whilst Non-responders retained their biomedical beliefs ‘Self-efficacy’ required confidence in biopsychosocial beliefs, independent problem-solving, decreased fear and return to function as displayed by the Responders. Uncertainty in beliefs maintained a degree of distress and dependence in Unclear Responders. Non-responders returned to seeking biomedical interventions.

Conclusions: Changing beliefs, pain coping, developing self-efficacy and instilling confidence through a mentoring process appears central to the success of CB-CFT. Further study is required to establish the optimal approach for Unclear and Non-responders. Ethics approval was granted by the Health Service Executive Mid-Western Ethics Committee, Ireland.

Key Practice Points:
• The experiences of Responders and Non-responders may differ in the extent to which patients adopt biopsychosocial beliefs and achieve self-efficacy.
• Changing beliefs required patient-active methods such as discussion, reflection and experiencing pain control.
• The achievement of self-efficacy required the cultivation of independent problem-solving, reduced fear and a return to function.

PHYSICAL ACTIVITY IN OBESITY HYPOVENTILATION SYNDROME

1 Physiotherapy Department, The Alfred, Prahran
2 Department of Physiotherapy, La Trobe University Clinical School, Bundoodle, Victoria
3 Institute for Breathing and Sleep, Austin Health, Heidelberg
4 Victorian Respiratory Support Service, Austin Health, Heidelberg
5 Department of Respiratory and Sleep Medicine, Royal Prince Alfred Hospital, Camperdown
6 Department of Allergy, Immunology and Respiratory Medicine, The Alfred, Prahran
7 Centre for Health Economics, Monash University, Clayton
8 Department of Pulmonary Physiology and Sleep Medicine, Sir Charles Gardiner Hospital, Nedlands

Question: What are the physical activity levels of people with newly diagnosed obesity hypoventilation syndrome, and is there a relationship with disease severity or quality of life?

Design: Prospective observational study.

Participants: Thirty two people with newly diagnosed OHS referred for treatment as part of a larger randomised controlled trial.

Outcome Measures: Physical activity was measured objectively using a Sense Wear Armband. Baseline measures of PaCO2 and body mass index were collected. Health-related quality of life was measured using the SF-36v2.

Results: Thirty two participants (14 female) with a mean age of 56 (50-10) years were included. The mean body mass index was 52 (10) kg.m-2 and PaCO2 52 (6) mmHg. The median time spend in sedentary behaviours (>1.5 METs) was 904 (IQR 780 to 1020) minutes per day, which represented 88% of awake time. The median time spent in moderate and vigorous physical activity (>3 METs) was 13 (IQR 3 to 28) minutes per day. There was no relationship between moderate and vigorous physical activity and PaCO2 (r = -0.262, p = 0.15) but there was with body mass index (r = -0.622, p < 0.001). On the SF-36v2, those with lower moderate and vigorous physical activity levels had worse physical function domain scores (r = -0.392, p = 0.03).

Conclusion: People with newly diagnosed obesity hypoventilation syndrome are markedly inactive, across the spectrum of disease severity. These extremely low levels of physical activity may contribute to morbidity and mortality risk.

Key Practice Points:
• Physical activity levels are extremely low in this group, and have not previously been described.
• Appears to be related to severity of obesity rather than obesity hypoventilation syndrome.
• Effect of sleep disordered breathing treatment on activity levels is unknown.

ABSTRACT OF CHANGING CLINICAL PRACTICE TO INCLUDE SUPPORT PESSARIES FOR THE MANAGEMENT OF PELVIC ORGAN PROLAPSE: THE IMPACT OF A ONE-DAY TRAINING PROGRAM

Burnett AM, Scammel AE, Neumann PB, Thompson JA, Briffa NK

Question: Does one day of training change the clinical practice of Continence and Women’s Health physiotherapists to include the provision of pessary care in their management of women with pelvic organ prolapse?

Design: A prospective cohort study.

Participants: Continence and Women’s Health practitioners from physiotherapy, nursing and medical professions with advanced clinical skills in prolapse management.

Intervention: Three one-day workshops, held in Adelaide and Melbourne between May 2010 and May 2012, provided education about pelvic organ prolapse and vaginal support pessaries, and an evidence-based approach to prescribing and fitting pessaries, based on new Clinical Practice Guidelines (2012). All participants also received supervised instruction and training in small groups, on live models, to acquire basic skills in fitting pessaries, and an evidence-based approach to prescribing and fitting pessaries.

Result: Ninety-eight health practitioners attended the training programs. Eighty (81.6%) were Continence and Women’s Health physiotherapists. Thirty-six (45%) physiotherapists provided feedback. Six (16.7%) had subsequently incorporated pessary care into their prolapse management, fitting a total of 16 pessaries. Five (13.9%) were in the readiness phase preparing to start.

Conclusion: This innovative program to teach pessary care to Continence and Women’s Health physiotherapists resulted in one third of them starting, or preparing, to provide pessary care in their clinical practice. A better understanding of the barriers to providing pessary care in Continence and Women’s Health physiotherapists is needed for it to become an accepted area of extended scope practice.

Key Practice Points:
• Training in pessary management is essential for safe practice. This training program resulted in one third of physiotherapists receiving subsequent training providing pessary care when managing prolapse.
• This innovative training model is unique but warrants further evaluation of the barriers to pessary care by Continence and Women’s Health physiotherapists.
PHYSICAL ACTIVITY, CARDIORESPIRATORY FITNESS AND WALKING CAPACITY IN CHILDREN WITH CEREBRAL PALSY: A DESCRIPTIVE STUDY

Butler J1, Ada L2, Johnson N2
1School of Physiotherapy, Australian Catholic University
2Discipline of Physiotherapy, The University of Sydney
3Discipline of Exercise and Sports Science

**Questions:** What is the amount and intensity of physical activity in children with cerebral palsy compared with their typically-developing siblings? Does cardiorespiratory fitness or walking capacity predict amount of physical activity in these children?

**Design:** A descriptive study.

**Participants:** A convenience sample of 10 children (8-12 years, male and female) with cerebral palsy who were able to walk independently, and 6 of their siblings.

**Outcome Measures:** Direct measures of physical activity were made using an ActiGraph GT3X+ activity monitor. A direct measure of cardiorespiratory fitness was made using a portable gas analysis system (Cosmed K4b2™) to measure maximal oxygen uptake (VO2peak) while participants performed a progressive exercise test on a treadmill. Walking capacity was measured by the 6-minute walk test.

**Results:** The children with cerebral palsy spent the same amount of time in moderate to vigorous activity (MD 1%, 95% CI -2 to 4) as their siblings. Neither cardiorespiratory fitness (r = 0.25, p = 0.48) nor walking capacity (r = 0.07, p = 0.84) predicted the amount of physical activity in the children with cerebral palsy.

**Conclusion:** The children with cerebral palsy, who could walk, had similar amounts of moderate to vigorous physical activity as their siblings. However, both groups of children were less active than recommended guidelines for physical activity. Therefore, it is worth investigating why children with cerebral palsy are not being physically active.

**Key Practice Points:**
- Children with cerebral palsy, who are able to walk, have the capacity to be physically active.

IDENTIFICATION OF BARRIERS TO PHYSICAL ACTIVITY AND PARTICIPATION IN CHILDREN WITH CEREBRAL PALSY: A DESCRIPTIVE STUDY

Butler J1, Ada L2
1The School of Physiotherapy, Australian Catholic University
2Discipline of Physiotherapy, The University of Sydney

**Questions:** What physical activities are children with cerebral palsy currently engaged in? Are there activities they would prefer to do if they had the choice? What do parents see as the barriers preventing their child from being engaged in their preferred activities?

**Design:** A descriptive study.

**Participants:** A convenience sample of 10 children (8-12 years, male and female) with cerebral palsy who were able to walk independently.

**Outcome Measures:** A list of 20 physical activities, which were representative of typically-developing children and could be undertaken by mildly impaired children with cerebral palsy either alone, or with other people, at home or within their community, was compiled. The children were asked to indicate whether they did the activity or would like to do the activity, whereas the parents were asked to indicate what they perceived as being barriers preventing their child from undertaking the activity.

**Results:** Eleven of the 20 activities were currently being undertaken by over half (50%) of the children. Nine activities were rated by children as less than 50% of the time and for most of these activities children and parents responded that these were activities they would like to be engaged in. Parents perceived potential barriers for 16 of the 20 activities (80%). The perceived barriers, in descending order of magnitude were, cost, location, time constraints, availability and safety.

**Conclusion:** Children with cerebral palsy were regularly engaged in physical activities representative of typically-developing children. Overcoming the perceived barriers could result in some of these activities being undertaken.

**Key Practice Points:**
- Children with cerebral palsy were regularly engaged in physical activities which are representative of typically-developing children.
- Parents perceived barriers which were either preventing their child from being engaged in physical activity, or from performing physical activity more frequently.

PHYSIOLOGICAL FUNCTION MODIFIES THE EFFECT OF COGNITIVE FUNCTION ON THE RISK OF MULTIPLE FALLS – A POPULATION-BASED STUDY

Martin KL1, Blazeard LJ, Srikanth VK3, Wood A2,3, Thomson R1, Sanders LM2, Callisaya ML2,1
1Menzies Research Institute, University of Tasmania, Hobart
2Stroke and Ageing Research Group, Neurosciences, Dept. of Medicine, Southern Clinical School, Monash Medical Centre, Monash University, Clayton
3School of Psychology, University of Birmingham, Edgbaston, United Kingdom B15 2TT, UK

**Question:** Does impaired physiological function modify the effect of poorer cognition on increased risk of falling in older people?

**Design:** Prospective cohort study

**Participants:** Three hundred and eighty six people aged between 60-85 years were randomly selected from the southern Tasmanian electoral role.

**Outcome Measures:** Cognitive (executive function/attention, memory, processing speed and visuospatial ability) and physiological (leg strength, reaction time, body sway, vision and proprioception) function were measured using standardised tests. Gait speed was measured on a computerised mat. Falls were collected prospectively over 12 months.

**Results:** The mean age of the sample was 72.2 (SD = 7.1) years with 215 (55.7%) men. Over the 12-month period, 94 (24.4%) participants had a single fall, and 78 (20.2%) had multiple falls. No significant associations were observed between cognitive function and risk of a single fall. The risk of multiple fall was increased with poorer performance in individual tests of executive (p < 0.05) and visuospatial function (p < 0.001) and a combined memory score (p < 0.001). The presence of greater body sway, weaker muscle strength, poorer vision, slower reaction time and slower gait speed amplified the effect of poorer cognitive function on the risk of multiple falls (p < 0.05).

**Conclusion:** The risk of multiple falls is increased by cognitive impairments, and those risks are magnified by poorer physiological function. These data may assist in falls-risk screening and targeting of falls prevention strategies.

**Key Practice Points:**
- Identifying cognitive impairment is an important component of a falls-risk assessment
- Physiotherapists should consider whether an older person has physical impairments in combination with cognitive impairment when assessing fall-risk
- Robustness in physical functioning may be able to compensate for a high falls-risk related to impaired cognitive function, or vice-versa.
UNEXPLAINED SIGNS AND SYMPTOMS AND CHRONIC PAIN – EVIDENCE AND CHALLENGES

Calvert P1, McCormick M2
1Women’s and Children’s Health Network, (inc Women’s and Children’s Hospital)
2Pain & Palliative Care Teams, Sydney Children’s Hospital

The physiotherapy management of paediatric patients with unexplained signs and symptoms and chronic pain is an interesting and ongoing challenge.

The presentation of children with such conditions can often be confusing, distressing and difficult to understand for the patient, family and clinicians alike. Whilst the presentations may be relatively uncommon the features of the presentations are highly disabling with the potential of having long term serious physical, amongst other, complications.

Whilst the need for physiotherapy interventions to address these disorders is widely recognised, there is little available in the way of specific management principles and in many centres the resources required to manage children with these conditions, and support their families, are not available. A systematic approach to treatment is vital, not least because the management of children with these conditions is often associated with extensive use of medical and allied health resources, but also for the individual involved, the course of recovery is often rocky and protracted.

One of the main goals of the rehabilitation process for both unexplained signs and symptoms and chronic pain in paediatric presentations is to assist the individual to return to function.

School attendance and physical functioning are important measures in the process of recovery and validated measures should be used.

There is significant and exciting evidence emerging in the field of paediatric chronic pain and in the management of presentations of unexplained signs and symptoms and physiotherapy has an important and significant role in contributing to the processes of developing best practice guidelines to not only effectively support the children and families suffering with these conditions but to also support each other as professionals to ‘VEER (validate, empathize, rehabilitate) in the right direction’.

THEM THAT’S GOT SHALL GET, THEM THAT’S NOT SHALL LOSE

Campbell SK
Professor Emerita, University of Illinois at Chicago, and Manager, Infant Motor Performance Scales, LLC

Around the world early intervention remains an elusive goal as children rarely begin therapy services in the first year of life. Children at dual risk for poor developmental outcomes because of both biologic and social factors are even less likely to receive early services. A key reason may be the lack of solid evidence for efficacy of early therapy for problems in the motor sphere. New approaches rather than more studies of traditional modes of therapy need to be designed and tested. In this address two new methods of intervention, one for newborns at dual social and biologic risk and one for children with perinatal brain injury and high risk for cerebral palsy, will be presented.

CLASSIFICATION-BASED COGNITIVE FUNCTIONAL THERAPY IN THE MANAGEMENT OF A FOOTBALLER WITH LOW BACK PAIN: A CASE STUDY

Caneiro JP1, 2, O’Sullivan P1, 2
1School of Physiotherapy, Curtin University, Perth
2Body Logic Physiotherapy, Perth

Question: Contemporary models propose the experience and responses to pain result from a complex interaction of bio-psycho-social factors, supporting the need for a multidimensional approach to dealing with persistent back pain. Is classification-based cognitive functional therapy (CB-CFT) effective for the management of an athlete with non-specific chronic low back pain (NSCLBP)?

Design: Single Case report. Ten week intervention; 3 and 6 months follow up periods.

Participants: State level footballer (20yo), with mechanically provoked NSCLBP was classified based on a multidimensional classification system with mal-adaptive: beliefs, cognitions and coping (hyper-vigilance, fear, stress, passive coping), motor control impairments associated with compressive loading and lifestyle factors (activity avoidance and sleep disturbance).

Outcome Measures: Roland Morris Disability Questionnaire (RMDQ), Orebro Musculoskeletal Screening (OMPSQ), TAMPA Kinesiophobia Scale. Pain Catastrophising Scale (PCS) and Patient Specific Functional Scale (PSFS).

Results: reduction in pain, disability and fear, culminating in return to full training and duties at work. Changes in scores from pre to post (six months) intervention (Orebro 109 to 69; RMDQ 13 to 0; PSFS 5 to 39; TAMPA 54/to 25; Catastrophising 28 to 1).

Conclusion: The case study demonstrated how CB-CFT that targets maladaptive beliefs and behaviours can be adapted to an athlete with NSCLBP to positively impact on their pain, disability and distress. The application of this patient centred approach to this case will be described. Further RCT research to test the efficacy of this intervention in sporting populations is required.

Key Practice Points:
- CB-CFT reduces pain, disability and fear in an athlete with NSCLBP.
- A CB-CFT approach that targets bio-psycho-social factors is effective in the management of an athlete with NSCLBP.
- Further RCT research to test the efficacy of this intervention in sporting populations is required.

TRANSLATION OF ERGONOMICS RESEARCH INTO PRACTICE

Caple DC

The transition of ergonomics into practice for office based work in driven by the opportunities provided by new technologies that enable remote access to the internet and new approaches to work organization arrangements. This is most evident with new corporate buildings in major cities. These are now moving away from Open Plan designs to Activity Based Workplaces (ABW). These provide a range of work settings based on the functions required. These include individual work points in quiet areas together with collaborative work spaces for small or large groups; teleconferencing and computer based group interaction areas. The focus of ergonomics is on the suitability of the holistic work environment and not to a specific work point design. Evaluation of the suitability of the work environment is based on the psychosocial needs of the workers as well as the function performance of the systems of work. This workshop will explore the future implications of changing work organizational arrangements on the physical and psychological needs of the workforce. It will include a range of case studies from industry sectors including Residential Aged Care, Agriculture, Construction and Transport.
AEROBIC TRAINING FOR YOUNG PEOPLE WITH CEREBRAL PALSY IN SPECIALIST SCHOOLS: A PILOT RANDOMISED CONTROLLED TRIAL

Carlon SL1, Taylor NF1,2, Shields N3,4, Dodd KJ4
1Department of Physiotherapy, La Trobe University, Melbourne
2Eastern Health, Melbourne
3Northern Health, Melbourne
4Faculty of Health Sciences, La Trobe University, Melbourne

Question: How safe and feasible is it to run aerobic training programs for young people with cerebral palsy in specialist schools?

Design: A Phase I two-group single-blinded randomised controlled trial with a 1:1 allocation ratio.

Participants: 8-18 year olds attending a specialist school, with a diagnosis of cerebral palsy, GMFCS I-III, and a reliable yes/no response. In the previous six months they must not have had surgery or botulinum toxin-A to the lower-limbs, or completed aerobic training.

Intervention: A supervised group 9-week aerobic training program, held three times weekly for 30 minutes during a school break. The control group completed an arts program for the same time and duration.

Outcome Measures: Primary outcomes were feasibility and safety. Feasibility included program attendance and adherence to training heart rate targets. Adverse safety events were recorded as serious or non-serious, expected or unexpected, and related or unrelated to the study. Secondary outcomes measured cardiovascular function.

Results: There were 19 participants in two groups; a total of 206 exercise sessions were attended with no serious adverse events. There were three adverse events, in two participants; these events were non-serious, expected, and related to the intervention. Participants attended an average of 79% of sessions; and there was 80% adherence to target heart rate. There were no between-group cardiovascular changes, though moderate effect sizes favouring the intervention group were found.

Conclusion: This Phase I trial has provided initial evidence of feasibility and safety. Adverse safety events were recorded as serious or non-serious, expected or unexpected, and related or unrelated to the study. Secondary outcomes measured cardiovascular function.

Outcome Measures: Both static and dynamic measures were used; Movement assessment battery for children (MABC), Bruininks-Oseretsky Test of Motor Proficiency, sway velocity, Neuromotor examination for children and adolescence, Motor Function Neurological Assessment. Battery, temporal and kinematic measurements of standing balance. Most commonly, the balance systems were challenged by altering the environment or starting position e.g. single and dual task conditions; alterations of sensory input; alterations of base of support.

Results: Twenty papers were identified of which three had MABC data that could be pooled for meta-analysis. Meta-analysis revealed that typically developing children (TDC) have significantly better balance ability (as measured by MABC) compared to children with ADHD (p<0.00001). Other studies reported inconsistent results, with some describing poorer balance performance and some equivalent performance to TDC. The effect of methylphenidate on balance performance in children with ADHD was also variable.

Conclusion: Children with ADHD may exhibit poorer performance than TDC in a range of balance tasks. Further research is required to confirm the nature and extent of the impact of ADHD on balance.

• Children with ADHD may demonstrate poorer performance on static and dynamic balance tasks in comparison to typically developing children
• The effect of methylphenidate on balance performance in children with ADHD is variable

WHAT IS KNOWN ABOUT BALANCE ABILITY AND POSTURAL STABILITY IN CHILDREN WITH ATTENTION DEFICIT/ HYPERACTIVITY DISORDER – A SYSTEMATIC REVIEW

Carr J1, McGinley J2, Morgan MP1
1Monash University, Frankston
2The University of Melbourne, Parkville

Question: What is known about balance ability and postural stability in children with Attention Deficit/Hyperactivity disorder (ADHD)?

Design: Systematic review with qualitative analysis of case control studies and randomised controlled trials. Meta analysis was performed where possible.

Participants: Children (< 18 years) diagnosed with any subtype of ADHD and no co-morbid disorder.

Intervention: Three studies explored the effect of methylphenidate on balance ability, the remaining studies described performance of children with ADHD compared to controls.

Outcome Measures: Both static and dynamic measures were used; Movement assessment battery for children (MABC), Bruininks-Oseretsky Test of Motor Proficiency, sway velocity, Neuromotor examination for children and adolescence, Motor Function Neurological Assessment. Battery, temporal and kinematic measurements of standing balance. Most commonly, the balance systems were challenged by altering the environment or starting position e.g. single and dual task conditions; alterations of sensory input; alterations of base of support.

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Conclusion: Children with ADHD may exhibit poorer performance than TDC in a range of balance tasks. Further research is required to confirm the nature and extent of the impact of ADHD on balance.

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• The effect of methylphenidate on balance performance in children with ADHD is variable

NUTTING OUT NEUROMUSCULAR KIDS: THE WHAT, WHY AND HOW OF ASSESSMENT

Carroll K, de Valle K, Kennedy R
Neuromuscular Team, The Royal Children’s Hospital, Melbourne

The neuromuscular disorders of childhood is a group of disparate conditions affecting the lower motor neurons that have an early onset. They include spinal muscular atrophies, peripheral neuropathies, myasthenic syndromes, muscular dystrophies and myopathies. The primary manifestation is one of weakness and secondary to this, features of contracture, deformity, motor delay, physical disability and respiratory compromise are frequently observed.

In recent years a number of standardised physical outcome measures specific to the neuromuscular population have been developed both for use in the clinical setting and within clinical trials. These enable accurate monitoring of disease progression as well as facilitating clinical decision-making and advocacy for funding.

This session will provide a critical overview of the assessment tools available and provide advice on how to select, access and reliably use some of the better outcome measures.

Key Practice Points:
• Revise common features of neuromuscular disease
• Give a critical overview of best practice outcome measures
• Develop the ability to choose and use the most appropriate neuromuscular assessments for particular children/adolescents

THE PROVISION OF WEIGHT MANAGEMENT AND HEALTHY LIFESTYLE ADVICE BY PHYSICAL THERAPISTS

Carter A, Snodgrass SJ1, Guest, M2
1Lecturer, Discipline of Physiotherapy, School of Health Sciences, The University of Newcastle, Newcastle
2Lecturer, Discipline of Occupational Health and Safety, School of Health Sciences, The University of Newcastle, Newcastle

Question: What are the current practices, beliefs, attitudes and knowledge of physiotherapists in regards to providing weight management and healthy lifestyle advice to clients who are overweight or obese?

Design: Observational study.

Participants: 65 physiotherapists working in the Hunter region of NSW, Australia.

Intervention: Self-administered questionnaire.
A SIMULATING EXPERIENCE – EFFECTIVENESS OF A CRITICAL CARE PATIENT MANAGEMENT COURSE FOR JUNIOR PHYSIOTHERAPISTS USING HIGH FIDELITY SIMULATION

Cary B1, Seller D1, Joffe C1, Greenfield K1, Jacobs C1
1Physiotherapy Department manager, St Vincent’s Hospital Melbourne
2School of Physiotherapy, Curtin University of Technology, Perth
3Centre for National Research on Disability and Rehabilitation Medicine (CONROD), The University of Queensland, Brisbane

**Question:** Does a professional development course using simulation training to teach physiotherapy assessment, clinical reasoning and treatment skills in the critical care setting improve participants' self-perceived knowledge, assessment and clinical reasoning skills?

**Participants:** The project was aimed at physiotherapists with limited critical care experience, including new graduates and physiotherapists working in regional centres where clinical supervision and teaching may be less accessible.

**Intervention:** Expert cardiorespiratory physiotherapists utilised the results of a survey of junior physiotherapists to develop six clinical scenarios. These scenarios encompassed cardiovascular assessment of the critical care patient, the complex critical care patient and the long stay critical care patient. A structured debrief session followed each scenario, allowing participants to reflect on their assessment, skills, clinical decision making and the scenario outcome. A set of skill sessions, including ECG interpretation, tracheostomy, mechanical ventilation, humidification, critical illness rehabilitation, suctioning, medications, imaging and non-invasive ventilation complemented the scenarios.

**Outcome Measures:** 12 participants attended, the maximum capacity of the course. Participants completed feedback using Likert scales to rate their understanding of and confidence in intensive care assessment and clinical reasoning.

**Results:** 45% of participants strongly agreed and 55% agreed that the simulated scenarios improved their assessment skills. 55% strongly agreed and 45% agreed that their clinical reasoning skills were improved.

**Conclusion:** Overall responses from the participants indicated that they felt the course was successful in improving their clinical skills and decision making, as well as giving valuable exposure to the management of clinical conditions and treatment procedures.

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**Key Practice Points:**

- Simulation training is a useful educational tool that provides inexperienced physiotherapists with exposure to critical care scenarios in a safe, learning-focused environment
- Participants benefited from structured debriefing with skilled cardiorespiratory physiotherapists
- The course facilitated development of participants’ skills, understanding and confidence in intensive care assessment and clinical reasoning

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**MEASUREMENT OF SLEEP POSTURE IN THE HABITUAL ENVIRONMENT**

**Cary DH1, Collinson R2, Sterling M3, Briffa K2**

1AAP Education, Esperance
2School of Physiotherapy, Curtin University of Technology, Perth
3Centre for National Research on Disability and Rehabilitation Medicine (CONROD), The University of Queensland, Brisbane

**Biography:** As a youngster I spent summer holidays on a relatives farm. I am reminded (as I have no recollection) at family gatherings; how I expressed my love for farming by planting a cricket stump in their new leather sofa when told it was time to leave. My first acupuncture treatment I qualified in 1987 and spent the next few years exploring Tasmania, Canada and USA. I returned in 1992 to complete my postgraduate diploma in manipulative physiotherapy and postgraduate diploma in clinical acupuncture. I was the inaugural W.A. chair of the ADNG group & WA representative on the A.P.A. Acupuncture Working Party that finalized the 'Guidelines for Safe Acupuncture'. I completed my Specialisation in musculoskeletal physiotherapy in 2009 and am currently completing my M. Philosophy (Physiotherapy) at Curtin University. I live on a farm, work with clients in a private practice and am writing a book "Secrets of Successful Sleeping".

**Question:** Can valid and reliable measures of sleep posture in the habitual environment, be obtained using infrared video recording?

**Design:** Test-retest reliability study.

**Participants:** Twenty physiotherapists.

**Intervention:** Participants viewed the same 36 randomised, video images of sleep postures on two occasions, at least two days apart. Participants recorded each viewed posture as one of four; supine, supported side lying, quarter prone and prone. Images viewed were a mix of natural light and IR and varied bed coverings; uncovered, under a sheet, and under a sheet plus duvet.

**Outcome Measures:** Validity and reliability of sleep posture recordings.

**Results:** Validity (comparison with correct answer): mean Cohen’s Kappa = 0.908, range: 0.765 – 1. Reliability inter-rater excellent: Fleiss Kappa = 0.832 (95% CI = 0.8158, 0.8446) and intra-rater was almost perfect: mean Cohen’s Kappa = 0.9257, range 0.801–1, with a value of 1 for 25% of the raters.

**Conclusion:** Valid and reliable assessments of sleep posture in the habitual environment can be obtained using portable, infrared video recording. Data collected this way has the potential to be useful for clinical and research applications.

**Key Practice Points:**

- Infrared video accurately records sleep posture
- Physiotherapists are accurate and reliable when viewing standard recorded images
**DO WE KNOW OUR SLEEP POSTURE AND STIFFNESS?**

Cary DH1,2, Collinson R2, Sterling M2, Briffa K2

1Esperance Physiotherapy, Esperance
2School of Physiotherapy, Curtin University of Technology, Perth

**Question:** Is there a difference between perceived and actual sleep postures? Is there a relationship between sleep posture and complaints of morning pain and stiffness?

**Design:** Cross sectional observational pilot study.

**Participants:** Fifteen sleeping adults were filmed using infrared video. Recordings were viewed to determine actual time spent in each of four postures; prone, supine, supported side-lying and quarter prone.

**Outcome Measures:** Participants completed a pre-sleep questionnaire in which they nominated the percentage of time they spent in each posture and the number of mornings per week they experienced pain and stiffness.

**Results:** Paired t-tests or the Wilcoxon Signed Rank test were used to compare actual versus nominated percentage time in each posture. In supine mean (SD) actual was higher than nominated (27.3 (26.4)% versus 18.5 (23.4)%, p = 0.019). There were no differences in supported side-lying (39.3 (26.5)% versus 39.3 (32.6)%) or quarter prone (28.4 (25.4) and 25.5 (28.1)%, p > 0.6). In prone the difference was significant (Median = 0.000, IQR = 25.54, p = 0.003) but difficult to interpret. When comparing posture and morning symptoms ANOVA was run separately on actual (average) supine, prone, side-lying and ¼ prone with group size 0, 1-3, >3 and 0-3, >3. In all cases, results were statistically insignificant.

**Conclusion:** Due to small sample size firm conclusions are difficult. The poor capacity for people to accurately predict their sleeping position suggest this may not be a good method of assessment. The preliminary data warrants further investigation with a larger sample size study.

**INVESTIGATING THE FEASIBILITY OF SLOW VITAL CAPACITY AND COUGH PEAK FLOW VERSUS TRADITIONAL SPIROMETRY IN CHILDREN WITH A NEUROMUSCULAR DISORDER**

Caterina M1, Patman S1, Travlos V1, Wilson A2, Hall GL3

1The University of Notre Dame Australia, Fremantle
2Princess Margaret Hospital for Children
3Telethon Institute for Child Health Research

**Biography:** Madeline Caterina is currently in her fourth year of a Bachelor of Physiotherapy (Honours) at The University of Notre Dame Australia. Throughout her studies she has developed a strong interest in the paediatric and cardiorespiratory fields of physiotherapy and has followed this interest through her honours research based on the respiratory assessment of children with a neuromuscular disorder. Madeline hopes to continue research in the future, while developing her skills as a new graduate physiotherapist.

**Question:** Are slow vital capacity and cough peak flow more feasible than traditional spirometry to use in the community to assess lung function of children with a neuromuscular disorder?

**Design:** Repeated measures proof-of-concept pilot study.

**Participants:** Children with a neuromuscular disorder with potential for respiratory complications.

**Intervention:** Slow vital capacity, cough peak flow and traditional spirometry were assessed on two different days.

**Outcome Measures:** The feasibility of each test was determined by analysing the success rates of each assessment. A testing session was deemed to be successful if at least two acceptable curves were recorded that were within 150 mL of each other for slow vital capacity and forced vital capacity, and 10% for cough peak flow.

**Results:** To date 13 children have participated, ten male and three female aged 5 - 16. Diagnoses: Duchenne Muscular Dystrophy (n = 6), Charcot Marie Tooth Disorder (n = 3), Nemaline Rod Muscular Hypotrophy (n = 2), Becker Muscular Dystrophy (n = 1) or Arthrogryposis (n = 1). Success rates in visit one: slow vital capacity = 61.54%; forced vital capacity = 61.54%; cough peak flow = 86.42%. Success rates in visit two: slow vital capacity = 76.92%; forced vital capacity = 61.54%; cough peak flow = 69.23%. There was no significant difference between success rates of ambulant and non-ambulant children.

**Conclusion:** Slow vital capacity and cough peak flow are more feasible than traditional spirometry in the community to assess the lung function of children with a neuromuscular disorder.

**Key Practice Points:**
- Based on pilot data, slow vital capacity may be the preferred method of assessment of vital capacity in the community due to its higher success rate.
- Cough peak flow demonstrates the highest success rates of all three tests and is therefore a feasible assessment to use in the community for children with a neuromuscular disorder.
- Further research is needed that investigates longitudinal changes in lung function to assess whether these tests are descriptive of respiratory changes as the disorder progresses.

**EFFECTIVE IMPLEMENTATION OF AN EXERCISE PROGRAM POST BREAST CANCER SURGERY**

Cepnja D, Maka K

Physiotherapy Department, Westmead Hospital, Sydney

**Questions:** Does a 12 week exercise program lead to improved range of motion and strength gains? Is there improvement in reported pain and disability? What is the impact on quality of life? Is there any change in bioimpedence measures and its impact on lymphoedema?

**Design:** Observational study.

**Intervention:** A supervised 12 week exercise group program for patients who have undergone breast cancer surgery.

**Outcome Measures:** Range of motion, strength, shoulder pain and disability index (SPADI), quality of life, six minute walk test and bioimpedence were measured at commencement of the group and upon completion of the group.

**Results:** The average age of patients referred to the group was 56 years (range of 29 to71 years). The average time since surgery was 6.9 months (range of 2 to 16 months). The average initial shoulder flexion ROM was 154.5° (range of 96 to176°) and the average initial shoulder abduction ROM was 134.5° (range of 93 to 170°). The mean within patient change for flexion range was 9.5 (95% CI 6.2 to 12.8, p = 0.003). The mean within patient change for abduction range was 8.5 (95% CI 4.3 to 12.7, p = 0.008). The mean within patient change for the SPADI was -12.3 (95% CI -4.4 to -20.01, p = 0.016). Bioimpedence measures remained stable.

**Conclusion:** A group exercise program, in line with current literature, can be effectively implemented in the clinic with encouraging results.

**Key Practice Points:**
- Range of motion and strength at the shoulder improves with a 12 week group exercise program
- Pain and disability is reduced after a 12 week group exercise program
- There is no exacerbation or production of lymphoedema symptoms during a 12 week group exercise program
PHYSIOTHERAPY TECHNIQUES USED IN THE MANAGEMENT OF PREGNANCY RELATED LOW BACK PAIN AND PELVIC GIRDLE PAIN

Ceprnja D, Maka K
Physiotherapy Department, Westmead Hospital, Sydney

Questions: What techniques are commonly used by physiotherapists in the management of pregnancy related lumbopelvic pain? How often are specific stabilising exercises utilised? Are specific stabilisation exercises progressed?

Design: Retrospective audit of physiotherapy intervention.

Method: An audit form was conducted on relevant patient files over a time period of a week. This was considered to be a “snapshot” of patients seen who would largely represent a typical sample of PPGP patients seen in the Physiotherapy Department at Westmead Hospital.

Results: A total of 20 patient therapy files were audited. Patients attended on average 2.55 physiotherapy sessions (range 1-4). The most used intervention was soft tissue massage with 90% of patients receiving this treatment. This was followed by muscle energy technique with 85% receiving this intervention. Education was reportedly provided to 75% of patients. Stabilisation exercises were prescribed to 60% of patients. Pelvic floor exercises were given to 50% of patients. Progression of stabilisation exercises occurred for 25% of patients. Gluteal exercises were prescribed for 20% of patients. Pelvic floor exercises were progressed in 15%.

Conclusion: Based on our results, the most common physiotherapy interventions used in the management of pregnancy related lumbopelvic pain are soft tissue massage, muscle energy techniques and education. Just over half the patients were prescribed specific stabilisation exercises, yet only a few were progressed with an exercise regime. The results provide evidence to support the choice of treatment by physiotherapists.

Key Practice Points:
• The most common physiotherapy techniques used in the management of pregnancy related lumbopelvic pain are soft tissue massage, muscle energy techniques and education.
• Specific stabilisation exercises are used in 60% of the cases.
• Progression of specific stabilisation exercises occurs in some cases.

THE DETECTION AND MANAGEMENT OF NEONATAL INSTABILITY OF THE HIP – A MIXED-METHOD STUDY

Charlton S1,2, Schoo A1, Andersson J1
1Stop Health
2Flinders University Rural Clinical School
3Blekinge County Hospital
4Flinders University
5Sweden

Question: Does early diagnosis and treatment of the potentially unstable hip prevent the development of hip dysplasia?

Background: Late detection of developmental dysplasia or congenital dislocation of the hip requires a more prolonged treatment period and may lead to hip arthroplasty in the third decade.

Design: A mixed-method study of 4 case studies and 2 cohort studies.

Participants: Neonates born in a regional South Australian hospital. Infants (n=4) born in a six-month period, those with risk factors for developmental dysplasia of the hip (n=20) and neonates in the implementation screening study (n=86).

Intervention: Neonatal clinical examination, initial ultrasound examination and follow up.

Outcome Measures: Comparison of hip coverage and stability, management of developmental dysplasia of the hip including splinting and age at completion of treatment.

Results: Case studies show that earlier detection and management of increased mobility may shorten the splintage time. The study of 20 infants demonstrates merit in anterior dynamic ultrasound focusing on hip stability rather than hip coverage in the Graf method. The screening study demonstrates that anterior dynamic ultrasound can be used successfully as a screening tool.

Conclusion: Although these studies are too small to prove the exact benefit of a neonatal screening program in Australia, evidence indicates that anterior dynamic ultrasound screening, as done in Sweden, could be of benefit, particularly in rural and remote areas where lower birth numbers may influence clinical experience.

Key Practice Points:
• Current protocols for examining the infant hip may not be identifying problems early enough.
• Early detection of increased mobility in the hip may allow for good parental education about positioning and wrapping thus leading to better outcomes for infants.

NURSING HOME RESIDENTS’ PREFERENCES AND PERCEPTIONS WHEN ENGAGING IN SEMI-STRUCTURED ACTIVITY WITH STUDENT VOLUNTEERS

Charron A1, Constantinou M1, Laakso L1, Kuys S1,2
1School of Rehabilitation Sciences, Griffith University, Gold Coast
2Allied Health Research Collaborative, The Prince Charles Hospital, Brisbane

Question: What social activities do nursing home residents prefer to engage in with physiotherapy student volunteers? How do residents perceive their dizziness, hydration, social isolation and overall quality of life?

Design: Prospective observational study.

Participants: Eight (4F; 3M) nursing home residents (aged 82 years) able to provide informed consent and eight (6F; 1M) physiotherapy students.

Outcome Measures: Choice of preferred activity undertaken with volunteer physiotherapy students, perceptions of hydration, dizziness and social isolation were determined through targeted questionnaire. Quality of life was determined using EuroQol-5D and cognition was measured using Short Portable Mental Status Questionnaire (SPMSQ). Physiotherapy student reasons for volunteering were investigated using open-ended questions.

Results: The majority (85.7%) of residents preferred spending time talking with students, with one resident preferring to engage in physiotherapy exercises. All residents reported experiencing some dizziness over the previous week and perceived they had adequate hydration. All residents reported feeling socially isolated since moving into their aged care facility. The majority of residents (57%) had one error (range 1-7) on the SPMSQ. Quality of life overall health status ranged from 75-100%. All physiotherapy student volunteers expressed a desire to give back to the community, to be able to engage with elderly people and practice their communication and clinical skills.

Conclusion: Nursing home residents feel socially isolated and would prefer to spend time talking to students. Residents appear to regularly experience dizziness and perceive they have adequate hydration. Despite this, overall quality of life is rated moderate to high.

Key Practice Points:
• Nursing home residents feel socially isolated and seek opportunities for talking with visitors.
• Residents may benefit from education and encouragement to increase water intake during the day.
• Physiotherapy students value highly opportunities for work experience and enjoy spending time with nursing home residents.
MANAGEMENT OF CONSTIPATION IN CHILDREN – PREVENTIVE MEDICINE

Chase J

Constipation occurs in around 3% of children and accounts for 3-9% of pediatric consultations. In 10-25% of referrals to gastroenterologists, constipation increases with age and there is a higher prevalence of constipation in boys with a ratio of 3:1 (Catto-Smith, 2005). In 30% of children with the condition persists into adolescence and adulthood (Proctor & Loader, 2003; van Ginkel, et al., 2003) at which stage it is known to be a predisposing factor for pelvic organ prolapse, both urinary and faecal incontinence. Further, the ways in which parents respond to children’s health complaints including abdominal pain, influences the frequency of symptoms (including IBS), disability days, and health care visits made by these children when they grow up (Whitehead et al., 1994).

Children with faecal incontinence and constipation are 3.5-5 times more likely to have behavioural scores in clinical range and poor quality of life.

Contidence physiotherapists have the skills to help these children, but, to do so need an understanding of the causes of constipation in children and an appreciation of the multi-disciplinary approach to meet the needs of these families.


ARE BEHAVIOUR PROBLEMS IN EXTREMELY LOW BIRTH WEIGHT CHILDREN RELATED TO THEIR MOTOR ABILITY?

Cherry K1, Danks M1, Burns YR1, Gray PH1, Watter P1

1 Australian Catholic University, School of Physiotherapy, Brisbane
2 University of Queensland, Brisbane

Kate Cherry is currently a 4th year student completing a Bachelor of Physiotherapy (honours) at Australian Catholic University, Brisbane. Kate also has a Bachelor of Science majoring in Biology from St Bonaventure University in New York State, USA.

Question: Are behaviour problems of 11 – 13 year old children born extremely low birth weight related to their prematurity or their concordant motor problems?

Design: Prospective longitudinal study.

Participants: Forty eight (27 male) non-disabled, otherwise healthy children born extremely low birth weight (<1000g) and 55 (28 male) term-born peers were recruited to the study.

Outcome Measures: Children completed the Movement Assessment Battery for Children. Parent report of behaviour was measured using the Child Behavior Checklist.

Results: Median total motor score for the extremely low birth weight group (median = 17.5, IQR 12.3) was significantly poorer than for the term-born children (median = 7.5, IQR 9, p < 0.001).

Total behavior problem score was significantly increased for the extremely low birth weight group (difference between means = 5.89, 95% CI 10.29 to 1.49, p = 0.009). Motor score was the only extremely low birth weight group (difference between means = 10.29 to 1.49, p = 0.009).

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Conclusions: Behavioural problems in 11-13 year old children born extremely low birth weight were related to their motor problems rather than their prematurity.

Key Practice Points:
- Mild motor impairment is related to behaviour problems in 11 - 13 year old children.
- Mild motor impairment in childhood is particularly related to problems in attention and social behaviours.
- Supporting motor ability in childhood may improve behaviour particularly in attention and social competence.

THE TWO FACES OF JANUS: LOOKING FORWARD, LOOKING BACK

Chirelli P

In ancient Roman religion and myth, Janus was usually depicted as having two faces that he looked to the future and to the past. Janus frequently represented time, because he could see into the past with one face and into the future with the other. In May 2005 Rob Herbert reported that a search of PEDro database for research reports of randomised controlled trials (RCT) or systematic reviews related to ‘pelvic floor or genitourinary system’ revealed 183 RCT’s and 40 systematic reviews. The same search today reveals 743 RCT’s and 143 systematic reviews! [1]

An achievement for Continence and Women’s Health Physiotherapists! What an achievement for Physiotherapy itself! It is with great pride I salute my colleagues’ achievements and looking back to days past of continence and women’s health physiotherapy will clearly highlight the magnitude of these achievements.

But what of the future? Can such Brobdingnagian strides be expected to continue? How can the profession best provide the increasing need for our help?

Aristotle said: “We are what we repeatedly do. Excellence then is not an act but a Habit”

What a great habit we seem to have gotten into. Abraham Lincoln once said “The best way to predict the future is to create it.”

I think the future for our profession looks bright.

Chirelli P

LATERAL EPICONDYLALGIA, SYMPTOM STATUS AND MOTOR CORTEX CHANGES

Chiphase L1, Vicenzino B1, Hodges P1, Schabrun SM2

1 School of Science and Health, University of Western Sydney, Sydney
2 NHMRC CORE in Spinal Pain, Injury and Health, The University of Queensland, Brisbane

Questions: Is there a difference in the excitability and organisation of the primary motor cortical territory devoted to extensor carpi radialis brevis (ECRB) and extensor digitorum (ED) between individuals with chronic lateral epicondylalgia (LE) and painfree controls? In chronic LE, is there a relationship between cortical parameters and measures of pain and disability?

Design: Observational, laboratory based study.

Participants: Eleven individuals with chronic LE and 11 age, gender-matched healthy controls.

Outcome Measures: Transcranial magnetic stimulation was used to map the cortical representation of ECRB and ED in both groups with outcomes including peak motor evoked potential (MEP) amplitude, volume and distance between maps. Clinical measures included pain intensities, the Chronic Pain Grade Questionnaire and the Patient Rated Tennis Elbow Evaluation.

Results: The cortical representation of ECRB was more excitable (increased volume; increased MEP amplitude) and exhibited greater overlap with the cortical territory of ED in LE compared to healthy controls (all p < 0.05). Increased ECRB excitability and greater representational overlap between ECRB and ED were associated with higher pain severity at rest and/or in the preceding 6 months (all p < 0.05). A novel finding was a reduced number of discrete peaks in the cortical representations obtained for ECRB and ED in chronic LE compared with healthy controls.

Conclusion: These data provide evidence that cortical organisation may be maladaptive in chronic LE and that this reorganisation may be associated with motor dysfunction and persistence/recurrence of pain in this population. These data provide evidence that cortical organisation may be maladaptive in chronic LE and that this reorganisation may be associated with motor dysfunction and persistence/recurrence of pain in this population.

Key Practice Points:
- Chronic LE is associated with changes in the excitability and organization of the motor cortical territory devoted to control of ECRB and ED.
- In LE subjects, the degree of change appears related to severity of pain.
- Treatment strategies that target these cortical changes require development.

Chipchase L1

1 School of Science and Health, University of Western Sydney, Sydney
2 NHMRC CORE in Spinal Pain, Injury and Health, The University of Queensland, Brisbane

Other Relevant References:
- Chipchase L1, Vicenzino B1, Hodges P1, Schabrun SM2
- Chase J

ARE BEHAVIOUR PROBLEMS IN EXTREMELY LOW BIRTH WEIGHT CHILDREN RELATED TO THEIR MOTOR ABILITY?

Cherry K1, Danks M1, Burns YR1, Gray PH1, Watter P1

1 Australian Catholic University, School of Physiotherapy, Brisbane
2 University of Queensland, Brisbane

Kate Cherry is currently a 4th year student completing a Bachelor of Physiotherapy (honours) at Australian Catholic University, Brisbane. Kate also has a Bachelor of Science majoring in Biology from St Bonaventure University in New York State, USA.

Question: Are behaviour problems of 11 – 13 year old children born extremely low birth weight related to their prematurity or their concordant motor problems?

Design: Prospective longitudinal study.

Participants: Forty eight (27 male) non-disabled, otherwise healthy children born extremely low birth weight (<1000g) and 55 (28 male) term-born peers were recruited to the study.

Outcome Measures: Children completed the Movement Assessment Battery for Children. Parent report of behaviour was measured using the Child Behavior Checklist.

Results: Median total motor score for the extremely low birth weight group (median = 17.5, IQR 12.3) was significantly poorer than for the term-born children (median = 7.5, IQR 9, p < 0.001). Total behavior problem score was significantly increased for the extremely low birth weight group (difference between means = 5.89, 95% CI 10.29 to 1.49, p = 0.009). Motor score was the only significantly predictor of behaviour score (b = 0.319, p = 0.006).

Age, gestational age or socio-economic factors did not predict behaviour.

Motor score was significantly related to the syndrome scores of attention (r = 0.505, p < 0.001) and social behaviour (r = 0.459, p < 0.001).

Conclusion: Behavioural problems of 11-13 year old children born extremely low birth weight were related to their motor problems rather than their prematurity.

Key Practice Points:
- Mild motor impairment is related to behaviour problems in 11 - 13 year old children.
- Mild motor impairment in childhood is particularly related to problems in attention and social behaviours.
- Supporting motor ability in childhood may improve behaviour particularly in attention and social competence.
THE CHARACTERISTICS OF A WELL PREPARED STUDENT FOR CLINICAL LEARNING: A DELPHI STUDY OF CLINICAL EDUCATORS

Chipchase L1, Buttrum P2, Dunwoodie R1, Hill AE1, Mandrusiak A1, Moran M1
1School of Science and Health, University of Western Sydney, Sydney
2Royal Brisbane and Women’s Hospital, Department of Physiotherapy, Brisbane

Questions: What are clinical educators’ views on the characteristics they perceive demonstrate that a student is well prepared for clinical learning?

Design: A two round on line observational Delphi study.

Participants: Expert clinical educators experienced supervising occupational therapy, physiotherapy and speech pathology students.

Method: The first questionnaire was emailed to 636 expert clinical educators who were asked to describe key characteristics that indicate a student is prepared for a clinical placement and ready to learn. Open-ended responses received from the first round were subject to a thematic analysis and resulted in six themes with 62 characteristics. In the second round, participants were asked to rate each characteristic on a 7-point Likert Scale.

Results: A total of 258 (40.56%) responded to the first round, while 161 clinical educators completed the second (62.40% retention rate). Consensus was reached on 57 characteristics (six themes) using a cut off of greater than 70% positive respondents and an interquartile deviation (I/D) of equal or less than 1. Conclusion This study identified 57 characteristics (six themes) as indicators of a student who is prepared and ready for clinical learning. Generally, clinical educators’ views appeared based on external professional traits, such as appropriate appearance, along with a willingness to be involved rather than specific levels of knowledge and understanding. A list of characteristics relating to behaviours has been compiled and could be provided to students to aid preparation for clinical learning and to universities to incorporate within curricula.

Key Practice Points:
• A list of characteristics has been compiled that can be provided to student to aid with preparation for clinical learning.
• In addition, the list provides a platform for discussions by professional bodies about the role of placement education.

GROSS MOTOR ASSESSMENT AT 12 MONTHS OF CHILDREN WITH CLUBFOOT UNDERGOING PONSETI MANAGEMENT

Chivers A1, Gray K1-2, Gibbons PJ1-2
1The Children’s Hospital at Westmead, Sydney
2The University of Sydney

The Ponseti management for clubfoot involves serial casting followed by three months of full time bracing in boots and bar. While this technique has excellent documented outcomes, there is concern that it may hinder early gross motor development.

Question: Do children with clubfoot who are treated with the Ponseti technique achieve early gross motor milestones at the same time as their ‘normal’ peers? If not, is gross motor delay isolated or a co-morbidity of wider delay?

Method: Assessor blinded, observational study.

Participants: 49 children (31 with clubfoot, 18 controls) assessed at 12 months of age.

Outcome Measures: Alberta Infant Motor Scale and Ages and Stages Questionnaire. A score less than the 5th centile on the Alberta Infant Motor Scale was considered abnormal.

Results: There was no significant difference in gross motor function between groups on either the Alberta Infant Motor Scale (p = 0.101) or the Ages and Stages Questionnaire (p = 0.08). Five children in the clubfoot group presented with gross motor delay on the Ages and Stages Questionnaire, however all were found to have at least one other area of delay, suggestive of a more systemic issue. A significant delay in the Problem Solving domain was identified in the clubfoot group only (p = 0.008).

Conclusions: Gross motor delay does not appear to be an adverse side effect of the Ponseti technique. It is unknown if issues identified with Problem Solving represent an isolated or ongoing issue. Further longitudinal data is currently being collected.

Key Practice Points:
• The Ponseti technique is unlikely to cause gross motor delay in children with clubfoot assessed at 12 months of age
• A significant delay in Problem solving was identified in the clubfoot group. It is unknown if this is isolated or an ongoing issue. Further research is required.

THE USE OF NINTENDO WII AS A PHYSIOTHERAPY INTERVENTION FOR PEOPLE WITH INTELLECTUAL DISABILITY

Chung A1, Harvey L2, Hassett L1,2
1Clinical Innovation and Governance, Ageing, Disability and Home Care, Department of Family and Community Services NSW, Parramatta
2Rehabilitation Studies Unit, University of Sydney, Sydney
3The George Institute for Global Health, Sydney
4Discipline of Physiotherapy, The University of Sydney, Sydney

Questions: How often and in what way is Nintendo Wii used across 12 weeks when prescribed as part of physiotherapy for people with intellectual disability?

Design: Prospective observational study.

Participants: Twenty people with mild (n=6), moderate (n=12) or severe (n=2) intellectual disability who accessed physiotherapy through a NSW government disability service provider. Participants were predominantly males (n=12) with a median age of 18.5 years (IQR 13 to 29 years) and lived either in the family home (n=14) or in supported accommodation (n=6).

Outcome Measures: Frequency, duration, intensity, play position and mode, and Nintendo Wii games played over 12 weeks, recorded daily by carers using a recording log and averaged over 2 week periods.

Results: Median time recorded using the Nintendo Wii was 14 minutes (IQR 9 – 23 mins) per day in weeks one and two, decreasing down to a median time of 5 minutes per day (IQR 0 – 18 minutes) in weeks 11 and 12. Participants and/or carers reported that the games involved light to moderate intensity exercise. Games were predominately played in standing and using one player mode (91% and 89%, respectively). The most commonly used games were bowling and boxing (Wii Sports) and penguin slide, ski jump and tight rope (Wii Fit Plus).

Conclusion: Nintendo Wii can be incorporated into home physiotherapy programs for people with intellectual disability. However usage drops off rapidly, thereby indicating physiotherapists need to work collaboratively with people with intellectual disability and their carers to determine feasibility and to develop strategies to support implementation.

Key Practice Points:
• Nintendo Wii is a feasible intervention for people with intellectual disability.
• Physiotherapists should use person and family centred practice to ensure clients are suitable and to support usage.
• Nintendo Wii involves mostly low or moderate intensity exercise in standing. This may be sufficient for some health benefits.
THE EFFECT OF TRUNK MUSCLE MORPHOLOGY ON UPPER BODY INJURY IN ELITE AUSTRALIAN FOOTBALL LEAGUE PLAYERS

Clarke AJ, Hides JA, Stanton WR, Smith MM

School of Physiotherapy, Australian Catholic University, Brisbane

Question: Is there a relationship between thickness and function of lumbo-pelvic muscles and upper body injury in elite AFL players?

Design: Prospective study.

Participants: 275 players across six AFL clubs were eligible to participate in the study. 259 players (94.2%) who had US assessment performed at the clubs were included in the analysis.

Main Outcome Measurements: Ultrasound (US) measurements were taken of the thickness and function of the transversus abdominus (TrA), multifidus, and internal oblique (IO) muscles. Club injury reports were used to determine the prevalence of upper body injury during the pre-season. Logistic regression analysis was conducted with the dependent variables of (i) multifidus, (ii) TrA, and (iii) IO thickness. The risk factors in the analysis were side to side thickness asymmetry (defined as ipsilateral minus contralateral to dominant kicking leg), muscle function (defined as at rest and contracted conditions), and history of low back pain.

Results: 37 players (14.3%) had sustained an upper body injury in the pre-season. Greater asymmetry of the L5 multifidus thickness at rest resulted in significantly increased likelihood of upper body injury (OR = 1.41 Chi-square = 5.25, p = 0.02). Multifidus asymmetry was unrelated to low back pain (p = 0.673). There were no differences found for muscle function, or for the TrA or IO measures.

Conclusions: This is the first study to show an effect of multifidus asymmetry on upper body injury. Findings will assist clinicians in screening and upper body injury rehabilitation, and indicates the need for intervention studies to investigate a role in injury prevention.

Key Practice Points:
- Previous studies have shown relationships between lumbo-pelvic muscle deficits and low back pain or lower limb injury
- Multifidus muscle asymmetry shown to increase the likelihood of an upper body injury
- Useful for screening purposes in Aussie Rules football population

DO PEOPLE WHO REPORT LOW BACK PAIN WITH SITTING, SIT IN A DIFFERENT POSTURE TO THOSE WITHOUT PAIN? AN OBSERVATIONAL STUDY

Chia KL, Claus AP, Hodges PW

School of Health & Rehabilitation Sciences, Division of Physiotherapy, The University of Queensland, Queensland

Question: How do sitting posture during a 10-min computer task, and perceived “good sitting posture” compare between people with and without low back pain (LBP)?

Design: Cross-sectional observational study.

Participants: Spine posture was measured with a 3-D motion tracking system in 16 participants with LBP who reported pain provoked by sitting for 1 hour or more, during a 10-min computer task. Participants also demonstrated a posture they considered to reflect “good sitting posture” these data were compared with previously published data from painfree individuals (n = 50).

Outcome Measures: Thoracolumbar (T5-T12-L3) and lumbar angles (T12-L3-S2) were measured with 3-D motion tracking (Vicon). Statistical analyses were conducted with Mann-Whitney U tests.

Results: During the 10-min computer task, participants with LBP sat with their thoracolumbar region in a similar posture to painfree participants (P = 0.61), but with a greater lumbar angle eight degrees more extended/lordosed (P = 0.005). When demonstrating their perceived “good sitting posture”, the participants with LBP sat more extended/lordosed at the lumbar region than painfree participants (P = 0.003).

Conclusion: Previous studies have demonstrated that people with LBP sit more slumped or in more extreme postures than painfree people. For a 10-min computer task when participants were distracted from the observation of their spinal posture, participants with LBP in this study adopted postures with flat to lordotic lumbar curves, which were more upright than the flat to slump postures of painfree participants. This raises the question of whether the lordotic lumbar postures were a cause or an adaptation to manage low back pain in sitting or could even potentially be the cause.

Key Practice Points:
- Participants with low back pain in sitting adopted a lordotic lumbar posture, which is clinically hypothesised to be more ideal than lumbar flexion.
- This sitting posture behaviour with low back pain that has not been reported before.
- Adoption of lordotic lumbar posture might represent and adaptation to manage/delay low back pain in sitting or could even potentially be the cause.

OPTIMUM BIOMECHANICS TO REDUCE THE SLIP RISK IN MANUAL HANDLING PUSH TASKS

Varcin-Coad L, Claus AP, van den Hoorn W, Hodges PW

The University of Queensland, Centre of Clinical Research Excellence in Spinal Pain, Injury and Health, School of Health and Rehabilitation Sciences, Brisbane, Queensland

Previous research showed that perceived effort and success rates in a patient lateral transfer task were influenced by the biomechanical strategy of pushing.

Question: Is there any difference in ground reaction forces of the foot-to-floor contact between three biomechanical strategies to perform a patient lateral transfer push task?

Design: Within-participant repeated measures study.

Participants: Thirteen healthy adult participants (four males).

Intervention: Participants performed lateral patient transfers of an 80 kg person lying supine on a slide sheet by leaning into the push (spontaneous push), and were then trained (in random order) (i) to push with their back straight and bent knees (squat push), or (ii) to push with a preparatory backwards and forwards movement of the pelvis (rockback push).

Outcome Measures: Forceplates (Bertec) recorded sagittal plane shear and vertical ground reaction force at both feet.

Results: The squat push strategy demonstrated a ratio of horizontal to vertical ground reaction forces of 0.27 (SD 0.07), the rockback strategy a ratio of 0.28 (SD 0.07) and the spontaneous push strategy a ratio of 0.32 (SD 0.06).

Repeated measures ANOVA with Duncan’s post hoc test showed a higher ratio of horizontal to vertical force in the spontaneous (leaning into the push) strategy than the squat or the rockback strategies (P = 0.005 & P = 0.035, respectively).

Conclusion: These data suggest that if conditions such as foot wear and floor surface are comparable, the squat push and rockback strategies would be likely to have lower risk of slipping than a spontaneous lean-in strategy for a patient lateral transfer.

Key Practice Points:
- A spontaneous push strategy had higher biomechanical slip risk than strategies with the shoulders above the pelvis.
- The rockback push strategy involves a low slip risk and low perceived effort for patient lateral transfers.

THE NATIONAL CLINICAL FRAMEWORK DEMONSTRATES PHYSIOTHERAPY LEADERSHIP IN HEALTHCARE DELIVERY

Coburn PT, Davidson M

1HDSS - TAC and WorkSafe Victoria, Comcare
2La Trobe University, Melbourne

Delivering quality health services in a cost effective manner is becoming an increasingly critical issue for insurance companies and government agencies. Where these institutions are subject to unsustainable increases in health cost, there is cause for legislation change or the implementation of rigid guidelines. The Clinical Framework is an alternative for institutions determined to control costs and maintain optimal clinical care. It consists of five principles that clinicians and institutions use to determine the ongoing need for intervention. The principles can be quickly read and understood. The Framework allows clinicians to exercise judgment in selecting treatment with due consideration to the evidence and patient’s individual needs. This approach commenced in 2003 as initiative within physiotherapy and received input from the Victorian Branch of the APA. It was subsequently broadened to apply to chiropractic, osteopathy, psychology, and occupational therapy. In 2011, the document underwent further refinement from the national bodies of the respective disciplines. In 2012 it was endorsed across Australia for motor accident and worker’s compensation bodies. In 2013 Federal Minister Shorten released a review of the Safety, Rehabilitation and Compensation Act which
recommended amendments including "medical treatment must meet objective standards such as those in the Clinical Framework." The development of Clinical Framework demonstrates clinical leadership by the physiotherapy profession and the APA in health care in Australia. This paper will discuss some of the issues that have been addressed in implementing the Clinical Framework on over 20,000 files over the past ten years.

**Key Practice Points:**
- The Clinical Framework is utilised across Australia for determining reasonableness of treatment by compensable bodies for a variety of allied health disciplines
- The Clinical Framework was developed and implemented by physiotherapists with input from the APA. This document represents leadership by profession in the broader field of healthcare delivery
- An understanding of the Clinical Framework will improve a practicing physiotherapist's ability to have treatment plans accepted for compensable patients

**TEACHING MANUAL HANDLING TO UNDERGRADUATE PHYSIOTHERAPY STUDENTS, WHERE ARE WE STARTING FROM?**

**Coffee J, Boucaut R, Milanese S**  
School of Health Sciences, University of South Australia, Adelaide

**Question:** Manual Handling training has not been found to be effective in injury prevention. There are a number of postulated reasons for this. It may be due to the measure of work injury itself or due to the complexity of the work context in which manual handling occurs. Alternatively, it may reflect the readiness of participants to take up the behaviours suggested in training. The Transtheoretical Model of Change (TTMC) is a theoretical staged model that describes a participant's readiness for behaviour change, and has been used to underpin the development of health promotion programs. The TTMC may be a useful framework to consider in relation to undergraduate teaching on manual handling.

**Design:** Cross sectional survey.

**Participants:** First year undergraduate physiotherapy students.

**Outcome Measures:** Basic understanding and experiences related to manual handling, and self-reported state of change.

**Results:** First year physiotherapy students present with a range of different views and experiences about manual handling.

**Conclusion:** The challenge for academics is to consider the implications and challenges this presents in the design and delivery of education and training in manual handling for this undergraduate cohort.

**Key Practice Points:**
- The Transtheoretical Model of Change (TTMC) provides a framework to guide the teaching of manual handling to undergraduate students.
- First year Physiotherapy students present a range of different stages of change within the Transtheoretical Model of Change.
- By understanding where physiotherapy students are within the TTMC framework instructional design and delivery of education and training in manual handling can be better targeted.

**SPINOPELVIC PARAMETERS, SAGITTAL BALANCE AND COMPENSATORY MECHANICS IN ADULTS WITH SPINAL DEFORMITY**

**Cohen Li**  
Pastural Physiotherapy, Sydney

**Questions:** Why are spinal surgeons showing increasing interest in sagittal spine deformity? What predictable, ageing and disease related and potentially reversible, compensations do our patients exhibit to address their sagittal balance issues? What clinical tools can physiotherapists use to measure sagittal balance and what impact does this have for physiotherapists?

**Design:** Retrospective observational pilot study.

**Participants:** Thirteen patients with adult spinal deformity who had undergone full spine and pelvis EOS radiological imaging.

**Outcome Measures:** Spino pelvic, compensatory and sagittal spine measurements were reviewed with regard to SRS-Schwab adult spinal deformity classifications. Age related subgroups were formed relative to mean.

**Results:** Mean age was 52 years (±17). Mean sagittal vertical axis (SVA) was 36mm (±56) with 30% of cases exceeding the uncompensated SRS threshold of ±50mm. Mean pelvic incidence (PI) - lumbar lordosis (LL) mismatch was 2 degrees (±15) but 62% of patients exceeded the ±9 degree SRS threshold for PI-LL mismatch. 75% of the older subgroup and 40% of the younger subgroup exceeded the PI-LL mismatch threshold (p = 0.29). 100% of the younger mismatch subgroup was below -9 degrees and 65% of the older mismatch subgroup exceeded 9 degrees (p = 0.42).

**Conclusion:** The small sample size affected results. Adults with compensated and uncompensated sagittal spine imbalances form part of the patient population seen by physiotherapists. These compensations are predictable and often ageing and disease related. Further study needs to be done to establish whether physiotherapy has a role in affecting sagittal balance parameters.

**Key Practice Points:**
- Poor sagittal spinal alignment correlates highly with pain, disability and HRQL outcomes.
- Physiotherapists appear to lack knowledge and skill in this field and are unprepared to properly manage this condition.
- Further clinical research is needed to clarify the scope of physiotherapy practice within sagittal alignment.

**Note regarding ethics**

No ethics approval has been given for this pilot study. However, all patients signed consent to research when entering the practice. I have attended Spine Society meetings and international conferences where it is acceptable practice within this field to review patient data for research purposes without formal ethics clearance. This work forms part of the preliminary analysis for a PhD proposal.

**MEDIALLY POSTED FOOT ORTHOSES DO NOT INCREASE THE KNEE ADDUCTION MOMENT IN INDIVIDUALS WITH PATELLOFEMORAL OSTEOARTHRITIS**

**Collins NJ,1 Fok L1, Ozturk H1, Dorn T1, Schache AG1, Pandy MG2, Crossley KM3,4**  
1 The University of Melbourne, Melbourne  
2 Stanford University, Stanford, USA  
3 The University of Queensland, Brisbane

**Question:** In people with patellofemoral osteoarthritis, do medially posted foot orthoses adversely increase medial tibiofemoral joint compartment load?

**Design:** Within-participant, repeated measures experimental study.

**Participants:** Eighteen adults (12 F; mean ± SD age 55 ± 10; body mass index 25.6 ± 3.2) with predominant patellofemoral osteoarthritis (osteophyte grade ≥1 on skyline radiograph, anterior knee pain during patellofemoral loading activities e.g. steps, squatting).

**Intervention:** Data were collected during walking at a self-selected speed under two conditions: i) running sandal (Nike Strap Runner); ii) sandal with prefabricated foot orthoses (Vasyli International; inbuilt arch support, 6° varus wedge).
HIP PATHOMECHANICS ASSOCIATED WITH SINGLE LEG SQUAT ARE RELATED TO DORSIFLEXION RESTRICTION IN PEOPLE WITH PATELLOFEMORAL PAIN

Collins NJ1, Hart HF2, Schache AG1, Vicenzino B2, Crossley KM12

1The University of Melbourne, Melbourne
2The University of Queensland, Brisbane

Question: Is greater hip adduction and internal rotation during single leg squats associated with foot and ankle kinematics, in people with patellofemoral pain?

Design: Cross-sectional experimental study.

Participants: Fourteen adults (8 F; mean ± SD age 38 ± 7; body mass index 25.7 ± 3) with chronic patellofemoral pain (>3 month duration, anterior knee pain during patellofemoral loading activities e.g. steps, squatting).

Outcome Measures: Dorsiflexion range of motion of the affected leg (most symptomatic leg if bilateral pain) was measured using the knee to wall test. Arch height ratio (arch height at 50% foot length/total foot length), as well as the change in arch height and midfoot width from non-weight bearing to weight bearing, were measured on the affected side using customised platforms. Participants performed five repetitions of a single leg squat (to 60° knee flexion) on their affected leg. Lower limb kinematics were measured using a nine-camera VICON motion analysis system. Peak hip adduction and internal rotation were calculated at maximal knee flexion and averaged over five trials.

Results: There was a significant negative correlation between dorsiflexion range of motion and peak hip adduction (-0.56, p=0.038) and peak hip internal rotation (-0.571, p=0.009). No significant correlations were observed between peak hip angles and arch height ratio, or arch height or midfoot width change (p>0.05).

Conclusion: Aberrant hip mechanics associated with poor performance on the single leg squat appear to be related to restricted dorsiflexion range of motion, rather than foot mobility.

Key Practice Points:
• To improve hip mechanics during single leg squat in those with patellofemoral pain, physiotherapists may seek to address limitations to dorsiflexion range of motion, rather than to strategies to support foot mobility.

THE EFFECTS OF A VARUS UNLOADER BRACE FOR LATERAL TIBIOFEMORAL OSTEOARTHRITIS AND VALGUS MALALIGNMENT AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

Hart HF1, Ackland DA1, Schache AG1, Pandy MG1, Collins NJ1, Crossley KM12

1The University of Melbourne, Melbourne
2The University of Queensland, Brisbane

Question: What are the immediate effects of a varus unloader brace on knee symptoms and biomechanics in a patient with lateral tibiofemoral osteoarthritis (TFJOA) and valgus malalignment after anterior cruciate ligament reconstruction (ACLR)?

Design: Single case study.

Participant: A 48-year old man with predominant radiographic and symptomatic lateral TFJOA after ACLR.

Outcome Measures: Knee symptoms were assessed using four 100 mm visual analogue scales where 100mm represents the worst possible symptoms (higher difficulty; greater instability; lower confidence; greater pain), and 0mm represents no symptoms following the step-down task with and without the varus brace. Knee biomechanics were assessed using quantitative gait analyses. The patient performed self-selected walking trials under three test conditions applied in random order via concealed allocation: (i) no brace; (ii) unadjusted brace; and (iii) adjusted brace with varus re-alignment.

Results: Paired t tests revealed no significant difference in peak knee flexion moment between conditions (mean difference -0.23 Nm/kg*ht, 95% CI -0.71 to 0.26).

Conclusion: Medially posted foot orthoses did not increase the external knee adduction moment, instead revealing a tendency towards decreasing it in those with patellofemoral osteoarthritis. The external knee adduction moment is an indirect measure of medial tibiofemoral load and is associated with the progression of tibiofemoral osteoarthritis. Therefore, medially posted foot orthoses may be used to reduce pain in people with patellofemoral osteoarthritis, without fear of progressing tibiofemoral osteoarthritis.

Key Practice Points:
• Findings of this study suggest that medially posted foot orthoses can be prescribed to reduce pain associated with patellofemoral osteoarthritis, without inducing additional loads on the medial tibiofemoral compartment which may accelerate development and progression of medial tibiofemoral osteoarthritis.

CLINICAL CLEARANCE OF THE CERVICAL SPINE FOLLOWING BLUNT TRAUMA: WHAT IS THE EVIDENCE?

Collins T, Shaw B
St Vincent’s Hospital Melbourne

Questions: In many increasingly busy Australian Emergency departments (ED) Primary Contact Physiotherapists are taking on a greater role in the assessment and management of patients presenting with blunt musculoskeletal trauma. It is pivotal that all clinicians working in this setting understand: What is the evidence for clinical clearance of the cervical spine following blunt trauma?

Design: A single patient seen by the PCP at STV

Outcome Measures: Two of the most common clinical decision making tools for cervical spine clearance (The Canadian C-Spine Rule (CCR), and National Emergency X-Radiography Utilisation Study (NEXUS)) will be reviewed.

Results: Current literature suggests the CCR rules demonstrated better diagnostic accuracy (99% sensitivity, 45% specificity) than NEXUS (91% sensitivity, 37% specificity).

Conclusion: Evidence suggests that the appropriate application of clinical decision making rules for cervical spine clearance following blunt trauma is safe and effective method for the detection of clinically significant cervical injuries. It is pivotal that physiotherapists working in this setting have a full understanding of the circumstances under which these can be employed.
Key Practice Points:
- With increasing numbers of ED presentations annually, all clinicians working in this setting are under a greater amount of pressure to see higher numbers of complex patients within tight timeframes.
- Patients with clinically significant cervical spine injuries can often present initially ambulant without any neurological deficit.
- Clinicians working in the ED setting must have a full understanding of the circumstances under which clinical decision making tools (such as CCR and NEXUS) are appropriate to be applied.

CLINICAL GOVERNANCE, EDUCATION, AND CREDENTIALING IN PRIMARY CONTACT PHYSIOTHERAPY IMPROVES CLINICAL PRODUCTIVITY

Collins T, Shaw B, Cary B, Joffe C
St Vincent's Hospital Melbourne

Questions: In 2012 Health Workforce Australia (HWA) funded a number of “Health Workforce Innovation” projects, one of which was Expanded Scope of Practice for Physiotherapists Working in Emergency Department (ED). Working within the confines of Victorian legislation means that expanding current scope of practice is limited. However, significant investment has taken place in the development of a standardised clinical governance framework, education, and credentialing pathways for Primary Contact Physiotherapy (PCP) in the ED. Does this actually translate to productivity improvements “on the ground” for this role?

Design: Retrospective audit of routine quantitative patient data collected through the Patient Administration System 2011/2012 against 2012/2013.

Participants: All patients presenting to the STV ED over the period of 2011-2013

Outcome Measures: Numbers of patients seen by PCP productivity improvement (% increase in clinical hours against % increase in patient numbers pre/post implementation), ED length of stay, waiting times, & representation rates.

Results: Clinical hours have increased on average 46% since HWA project implementation. The number of patients seen by the PCP has increased on average 121%. Furthermore, both patient waiting times and ED length of stay have decreased. Despite the significant increase in patient throughput, unplanned representation rates have remained stable.

Conclusion: Results demonstrate that investment in clinical governance structures, and education/credentialing pathways for the PCP role directly leads to significantly improved productivity outcomes.

Key Practice Points:
- Advanced-practice physiotherapists working in Victorian ED’s are currently working at the boundaries of the scope of practice permitted by state legislation.
- Productivity within this role can be restricted inadequately clinical governance, education, or credentialing frameworks to adequately support the position.
- Investment in all of the above significantly enhances the capacity for practitioners working in this setting to see more patients in a timely, efficient, and safe manner. Ethics approval granted from STV Research Governance Unit.

Outcome Measures: Several different outcome measures were used across the studies, and were pooled into two distinct categories based on the type of function that they were predominantly testing: 1) bimanual upper-limb function outcomes (Assisting Hand Assessment, Besta assessment and kinematic measures) and, 2) unimanual upper-limb function outcomes (Melbourne Assessment of Unilateral Upper Limb Function, Jebson-Taylor Test Hand Function and Quality of Upper Extremity Skills Test).

Results: Four “moderate-high” quality randomised controlled trials met the inclusion criteria. Effect sizes were calculated as standardised mean differences due to the various outcome measures used. There was a trend favouring constraint-induced movement therapy over bimanual therapy for overall upper-limb function (SMD 0.11, 95% CI -0.01 to 2.3), and for bimanual therapy over constraint–induced movement therapy for bimanual upper-limb function (SMD -0.10, 95% CI -0.27 to 0.08), however no statistical significance was found for either result. A statistically significant difference was found in favour of constraint-induced movement therapy over bimanual therapy for unimanual upper-limb function (SMD 0.29, 95% CI 0.12 to 0.45).

Conclusion: Further studies, with adequate power, are required to draw meaningful conclusions and thus justify the use of constraint-induced movement therapy over bimanual therapy in clinical practice.

Key Practice Points:
- There is a trend favouring constraint-induced movement therapy over bimanual therapy for improving unimanual upper-limb function.
- Constraint-induced movement therapy is more effective than bimanual therapy for improving unimanual upper-limb function.
- Future research should investigate the long-term effectiveness of the interventions and incorporate outcome measures from other domains.

ATTITUDES OF PHYSIOTHERAPY STUDENTS TOWARDS MENTAL HEALTH, PSYCHIATRY AND THE UNDERGRADUATE CURRICULUM

Connaughton J, Gibson W
School of Physiotherapy, The University of Notre Dame Australia, Fremantle

Questions: What are Physiotherapy students’ attitudes towards psychiatry and mental health? Are there differences between students who have experienced clinical placements and those who have not? What do Physiotherapy students perceive should be included in the undergraduate curriculum to better prepare them to deal with these issues on clinical placement?

Design: Observational study.

Participants: Students in their first two years of Physiotherapy course before attending any clinical placements (n=130) and final year students who have completed four of six clinical placements (n=63). There was an 89% (n=172) response rate.

Outcome Measures: The international questionnaire ‘Attitudes Towards Psychiatry’ and two open ended questions on perceptions of curriculum. A score above 90 on the questionnaire indicated positive attitude to psychiatry.

Results: Scores from this Australian study were similar to those from Europe. Attitudes to psychiatry were generally positive (mean 103.1, SD 11.5). Students who had completed clinical placements had a more positive attitude than those who had not (mean difference 7.183; 95% CI 10.9 to 3.5; p < 0.001) Students identified that they saw many more patients with a co-morbid mental illness than expected. Students had received two lectures on psychiatry but identified that they wanted more information including education about psychiatric presentations, common psychiatric assessments and treatments, medications and their side effects as well as strategies on communicating with and engaging people with mental illness.

Conclusion: Physiotherapists treat many patients with associated psychiatric issues. Students identified that undergraduate programmes should include more education on psychiatry in preparation for clinical practice.

Key Practice Points:
- Students did not realise how many people with psychiatric issues they would be treating on clinical placement.
- Students identify that more education on mental health and psychiatry should be included in the undergraduate programme.
- Physiotherapy students have a positive attitude towards mental health and psychiatry.

IS CONSTRAINT-INDUCED MOVEMENT THERAPY MORE EFFECTIVE THAN BIMANUAL THERAPY AT IMPROVING UPPER-LIMB FUNCTION IN CHILDREN WITH HEMIPLIGIC CEREBRAL PALSY?

Norman AS, Comben TA
4th Year Students, Bachelor of Health Science/Master of Physiotherapy Practice, La Trobe University, Melbourne

Design: Systematic review with meta-analysis of randomised controlled trials.

Participants: Children aged 0-18 years with hemiplegic cerebral palsy.

Intervention: Constraint-induced movement therapy compared to bimanual therapy. Adjunct botulin-toxin A therapy was excluded unless part of routine therapy.
THE RELATIONSHIP BETWEEN MUSCLE STRENGTH AND SIZE, PHYSICAL ACTIVITY LEVELS AND FUNCTION IN HIP OSTEOARTHRITIS; A CROSS SECTIONAL STUDY

Constantinou M1,2, Barrett R1,2, Beck B1,2, Loureiro A1,2, Mills P2,3
1Centre for Musculoskeletal Research, Griffith Health Institute, Griffith University, Gold Coast campus, Australia
2School of Rehabilitation Sciences, Griffith Health, Griffith University, Gold Coast campus, Australia
3University, Gold Coast campus, Australia

Question: Is there a relationship between lower limb muscle strength and size, physical activity levels and function in hip osteoarthritis (OA)?

Outcome Measures: Isometric maximal voluntary contraction of lower limb muscle strength, thigh muscle cross-sectional area (CSA) and density using peripheral quantitative computed tomography scan, a timed stair test and monitored physical activity levels.

Results: Thigh muscle density was less for hip OA than controls. There was a significant difference for the Timed Stair Test between hip OA and controls (Hip OA = 10.7 ± 1.7, Controls = 14.4 ± 4.5 seconds, p = 0.004). There was a positive relationship between hip adductor strength for light (r= -0.40, p < 0.05) and moderate (r= -0.52, p < 0.05) physical activity levels and a negative correlation between hip muscle strength and time to complete the Stair Test (r = -0.540, p < 0.014) in the hip OA group.

Conclusion: Participants with hip OA have lower thigh muscle density and greater concentration of intra-muscular fat than controls. Weaker hip muscles were associated with reduced functional stair task and lower physical activity levels in hip OA.

THE MELBOURNE RETURN TO SPORTS SCORE (MRSS) – AN ASSESSMENT TOOL FOR RETURN TO SPORTS FOLLOWING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

Bourke HE, Gajjar SM, Cooper RL, Bartlett RJ, Morris HG

Question: Can you predict a successful return to sport following surgical reconstruction of the Anterior Cruciate Ligament?

Participants: 84 patients previously involved in pivoting or cutting sports underwent primary ACL reconstruction by the same surgeon. They were assessed physically and subjectively 6–9 months following surgery and were given a Melbourne Return to Sports Score (MRSS).

Outcome Measures: At a minimum of 2 years after surgery patients completed a further IKDC score, a Tegner activity score and a questionnaire designed by us to establish which patients had returned to their pre-injury sport. Competitive level and subjective form was recorded pre-injury, in the first year of return to sports and at 2 years.

Results: 84/94 patients responded with 10 lost to follow-up. 57/84 (68%) patients had returned to their pre-injury sports. Patients who returned to sports had significantly higher MRSS scores (mean 94.1 (5.56)) than those who did not return to sports (mean 87.8 (7.13)), p < 0.001). Of those who returned to their sports 65% returned at a lower competitive level initially than their pre-injury level and these patients had significantly lower scores than those who achieved their pre-injury level (p < 0.015).

Conclusion: Despite relatively small numbers higher MRSS scores appear indicate a greater chance of returning to pre-injury sports and in the short term predicts a quicker return to form. The score is a useful tool for the surgeon and physiotherapist and may provide a mental aid for the patient assisting a successful return to play.

Key Practice Points:

- A higher MRSS results in a greater chance of returning to pre-injury sports
- The MRSS is a simple and easily applied clinical tool
- The MRSS may provide a mental aid to people following surgical reconstruction of the ACL

NEW MOVES FOR THE SHOULDER: CORRECTION OF SCAPULAR DYSKINESIS IN THE OVERHEAD ATHLETE

Cools A

Several studies have illustrated that scapular muscle recruitment patterns such as muscle strength, inter- and intramuscular balance, and muscle latency times, are often disturbed in overhead athletes suffering from chronic shoulder pain and impingement symptoms. These findings emphasize the need for a science-based scapular rehabilitation program for overhead athletes with scapular dyskinesis.

Rehabilitation of scapular dyskinesis should start with a thorough examination of the patient’s functional deficits at scapular level. Flexibility as well as muscle performance deficits may be present. Flexibility deficits in the surrounding structures (pect minor, levator scapulae, rhomboid, posterior shoulder capsule and posterior rotator cuff muscles) may lead to a lack of scapular mobility, and need to be addressed properly. Manual joint mobilizations and muscle stretching, as well as some stretching programs, soft tissue techniques and mobilization with movement have been advised to restore normal scapular mobility. Muscle performance deficits may be characterized by motor control as well as strength deficits, both leading to imbalances in the scapular muscle force couple, and thus to scapular instability. Research has revealed hyperactivity in the upper trapezius, with concurrent weakness and motor control deficits in the lower part of the trapezius and serratus anterior. Exercises need to be selected based on their specific goal and action. In the different stages of rehabilitation with increasing demands on neuromuscular coordination and strength. In the final stage of rehabilitation, sportspesific challenges should be achieved through functional high load exercises and preventive stretching.

HOW DO YOU AND YOUR COLLEAGUES TREAT CERVICAL RADICULOPATHY? A NATIONWIDE SURVEY OF MPA MEMBERS

Coppieters MW1,2,3, Nee RJ1,2, MacDermid J1, Jull G1
1School of Health and Rehabilitation Sciences, The university of Queensland, Brisbane
2Pacific University, School of Physical Therapy, Hillsboro, Oregon, USA
3School of Rehabilitation Sciences, McMaster University, Hamilton, Canada

Question: Considering the absence of clinical practice guidelines or high level evidence to guide treatment, this study investigated the practice patterns of MPA physiotherapists for the conservative management of cervical radiculopathy.

Design: Self-administered electronic survey.

Participants: Surveys were sent to all non-student MPA members (N=1942).

Intervention: To document practice patterns, a survey was created based on interventions that appeared in published clinical trials or prospective case series, and on the authors’ expertise. Because the clinical presentation of radiculopathy varies, a typical case scenario was pilot tested based on reports in the literature was included in the survey. The questionnaire and case scenario were piloted prior to distribution.

Outcome Measures: Physiotherapists rated how often they used each of 30 selected interventions for a typical patient with cervical radiculopathy, a typical case scenario. The questionnaire and case scenario were piloted prior to distribution.

Intervention: To document practice patterns, a survey was created based on interventions that appeared in published clinical trials or prospective case series, and on the authors’ expertise. Because the clinical presentation of radiculopathy varies, a typical case scenario was pilot tested based on reports in the literature was included in the survey. The questionnaire and case scenario were piloted prior to distribution.

Outcome Measures: Physiotherapists rated how often they used each of 30 selected interventions for a typical patient with cervical radiculopathy, a typical case scenario. The questionnaire and case scenario were piloted prior to distribution.

Questions:
- What are the 3D swing characteristics of amateur golfers with non-specific low back pain?
- How can effective injury prevention programs be developed for golfers who continue to participate in golf?

Outcome Measures:
- Position and orientation data related to swing phase characteristics including address position, backswing, downswing and impact positions were extracted from the records of each participant and compared to normative values of healthy individuals provided by Golf Biodynamics inc.
- The 3D characteristics of amateur golfers with non-specific low back pain strayed from the normative values most significantly during the downswing phase of their swing. The variables in which the greatest number of individuals fell outside of the normal ranges were hip sway, head turn and hip turn during the downswing phase. Overall, hip sway was the characteristic most commonly seen outside of the normal range in this cohort.

Conclusions:
- This study demonstrates that amateur golfers with low back pain appear to have stability issues in the downswing phase of their golf swing which may be an important factor in the causation and/or aggravation of their non-specific low back pain. This finding has implications for the types of rehabilitation and retraining programs these golfers should undertake so that they can continue to participate in golf.

Key Practice Points:
- Non-specific low back pain in amateur golfers may be associated with their downswing biomechanics
- Hip sway during the downswing phase should be monitored carefully during the rehabilitation of amateur golfers with non-specific low back pain.
- Prospective and longitudinal studies comparing amateur golfers with and without non-specific low back pain are required to determine any causation between specific biomechanical characteristics and development of non-specific low back pain.

Early Moves: Current Practice of Early Mobilisation in an Australian Stroke Unit

L. M. Cormack1, M. Firth2
1 Physiotherapy Department, Sir Charles Gairdner Hospital, Perth
2 School of Physiotherapy, Curtin University, Perth

Questions:
- What is the current practice of early mobility and activity after stroke in an Australian tertiary hospital stroke unit? How does this level of activity compare with previous studies in this area?

Design: Prospective observational study

Participants: Eighteen consenting patients with acute stroke (Days since stroke 1 – 22) managed in a tertiary stroke unit

Outcome Measures:
- Activity levels and people present were recorded every 10 minutes for 2 days from 8am – 5pm

Results:
- Overall, patients spent 50.7% of the day in bed, 29.0% sitting and 13.4% in higher level activities. Levels of activity in patients with severe stroke were shown to be higher than previous Australian studies and a recent study completed in Trondheim, Norway. Significant correlations were found between levels of activity and severity of stroke, patient age and days since stroke (p < .0001). Patients spent on average 34.4% of their day alone, well below that recorded in previous studies (60.4%, 51.3%).

Conclusions:
- This study demonstrates that higher levels of activity and less time alone are possible in patients with acute, severe stroke in an Australian setting. Further studies to identify contributing factors to early mobilisation are warranted.

The 3D Characteristics of the Swing Phase of Amateur Golfers with Non-Specific Low Back Pain. A Retrospective Observational Study

Mr Ben Corso1, Dr Julie Walters2
1 The Physio Clinic
2 The University of South Australia

Questions:
- What are the 3D swing characteristics of amateur golfers with non-specific low back pain?

Design: Retrospective observational study.

Participants: The 3D kinematic data of 60 amateur golfers (48M, 12F, age 59 ± 12) who had presented to a specialist physiotherapy practice with chronic non-specific low back pain between 2008 and 2013 were used in this study.

Results:
- This study enables the design of a representative multimodal physiotherapy intervention for cervical radiculopathy. Its effectiveness can be tested in future trials.

Early Moves: Current Practice of Early Mobilisation in an Australian Stroke Unit

Conclusion:
- MPA physiotherapists use various combinations of biologically plausible interventions in the management of cervical radiculopathy.

Key Practice Points:
- MPA physiotherapists typically combine education, manual therapy, exercise, and self-management when treating cervical radiculopathy.
- Patients who understand their problem, adherence to self-management, and early pain relief are thought to have better outcomes.
- This study enables the design of a representative multimodal physiotherapy intervention for cervical radiculopathy. Its effectiveness can be tested in future trials.

Shoulder Injuries in Elite Male Gymnasts: How Can We Prevent Them When We Haven’t Identified the Risk Factors?

Cossens P

Creating effective injury prevention programs is difficult. Even when risk factors are clearly identified, the implementation of such programs into the athletic community is challenging. In 2008 the Australian men's gymnastics team National coach asked for a program to prevent shoulder injuries amongst our elite male gymnasts. The request is simple, but the solution is very complex. The first challenge; quantify the problem. Injury monitoring amongst our National squad over two years demonstrates the enormity of the problem amongst our senior athletes. To get an understanding in a broader context, a cross sectional study was developed, attempting to capture data from all state representative male gymnasts across the country, from under 12’s to senior. Over 200 gymnasts have been included in this study to date. These athletes have provided information on shoulder pain, training history and have undertaken a battery of physical tests for the shoulders and thoracic spine. Phase two of this project involves a longitudinal study design, reassessing initial measure as we attempt to identify risk factors associated with onset of shoulder pain. To date, 55 gymnasts have provided follow-up data of at least two-year duration. The current findings of these studies will be discussed, while strategies for shoulder injury prevention will be proposed with consideration of the barriers that remain.

The 3D Characteristics of the Swing Phase of Amateur Golfers with Non-Specific Low Back Pain. A Retrospective Observational Study

The University of South Australia

Questions:
- What are the 3D swing characteristics of amateur golfers with non-specific low back pain?

Design: Retrospective observational study.

Participants: The 3D kinematic data of 60 amateur golfers (48M, 12F, age 59 ± 12) who had presented to a specialist physiotherapy practice with chronic non-specific low back pain between 2008 and 2013 were used in this study.

Results:
- The 3D characteristics of amateur golfers with non-specific low back pain strayed from the normative values most significantly during the downswing phase of their swing. The variables in which the greatest number of individuals fell outside of the normal ranges were hip sway, head turn and hip turn during the downswing phase. Overall, hip sway was the characteristic most commonly seen outside of the normal range in this cohort.

Conclusions:
- This study demonstrates that amateur golfers with low back pain appear to have stability issues in the downswing phase of their golf swing which may be an important factor in the causation and/or aggravation of their non-specific low back pain. This finding has implications for the types of rehabilitation and retraining programs these golfers should undertake so that they can continue to participate in golf.

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- Prospective and longitudinal studies comparing amateur golfers with and without non-specific low back pain are required to determine any causation between specific biomechanical characteristics and development of non-specific low back pain.

Health Services on the Edge

Costello T

At every level from the local to the global communities make choices about how health care is organised and resourced. In many parts of the world resources are scarce and the choices are difficult. Everywhere communities face ever-growing demand and competing priorities. Good solutions are not always easy to sell to governments or citizens. Based on his extensive experience both at the grassroots community level and at the tables of power, Tim Costello will explore some of the dilemmas facing decision-makers both in Australia and in the developing world. He will connect the questions surrounding health care provision to wider issues of human development and the well being of future generations.
EFFECTIVENESS OF TRIGGER POINT DRY NEEDLING FOR PLANTAR HEEL PAIN: A RANDOMISED CONTROLLED TRIAL

Cotchett M

Background: Plantar heel pain can be managed with dry needling of myofascial trigger points, however there is only poor quality evidence supporting its use.

Objective: To evaluate the effectiveness of dry needling for plantar heel pain.

Design: Parallel group, participant blinded, randomized controlled trial.

Setting: A university health sciences clinic.

Patients: Study participants were 84 patients with plantar heel pain of at least one month’s duration.

Intervention: Participants were randomised to real or sham trigger point dry needling. The intervention consisted of one treatment per week for six weeks. Participants were followed for 12 weeks.

Measurements: Primary outcome measures included ‘first-step pain’ measured with a Visual Analogue Scale and foot pain measured with the pain subscale of the Foot Health Status Questionnaire. The primary end-point for predicting the effectiveness of dry needling for plantar heel pain was six weeks.

Results: At the primary end-point, significant effects favored real dry needling over sham dry needling for pain (adjusted mean difference of VAS first step pain: -14.4 mm; 95% CI -23.5 to -5.2, p = 0.002; FHSQ foot pain 10.0 points. 95% CI 1.1 to 19.1, p = 0.029), although the between-group difference was lower than the minimal important difference. The number needed to treat at six weeks was 5 (95% CI 2 to 7/1). The frequency of minor transient adverse events was significantly greater in the real dry needling group (70 real dry needling appointments [32%] compared with only 1 sham dry needling appointments [<1%]). Limitations it was not possible to blind the therapist.

Conclusion: Dry needling provided statistically significant improvements in plantar heel pain, but the magnitude of this effect should be considered against the frequency of minor transient adverse events.

WEARING A SIMPLE ABDOMINAL SUPPORT GARMENT POSTNATALLY REDUCES ASSOCIATED BOTHER IN WOMEN WITH RECTUS ABDOMINIS DIASTASIS

Cragg T1, Briffa K2
1Royal North Shore Hospital 2Curtin University

Question: Does wearing a simple abdominal support garment post-birth improve the recovery of rectus abdominis diastasis in postnatal women?

Design: Randomised controlled trial with assessor blinding and intention-to-treat analysis.

Participants: Twenty-one postnatal women within 72 hours after childbirth, with a contracted rectus abdominis diastasis ≥3 cm at the umbilicus completed the study.

Intervention: All participants received education and performed transversus abdominis exercises. Additionally, those in the intervention group wore an abdominal support garment (double layer of flexigrip) for ≥8 hours per day for 4 weeks.

Outcome Measures: The primary outcome was change in rectus abdominis diastasis (mm) measured with a vernier caliper, at rest and with active contraction. Secondary outcomes were change in 100 mm VAS scores for a) pain and b) bother. Measures were taken at baseline and 4 weeks later.

Results: Rectus abdominis diastasis, pain and bother improved significantly in both groups (p < 0.015). VAS for bother decreased 40 (95% CI 13 to 67) mm more in the intervention group (p = 0.029) but changes in rectus abdominis diastasis and pain did not differ between groups. Percentage of responders, defined as achieving >50% improvement in contracted rectus abdominis diastasis at 4 weeks, was 10% in the control group versus 36% in the intervention group (p = 0.31). No detrimental effects were identified from wearing the support.

Conclusion: Physiotherapists should continue to offer postnatal women with rectus abdominis diastasis the option to wear an abdominal support garment. Further research via a multi-centre trial is recommended.

Key Practice Points:
• Rectus abdominis diastasis in postnatal women improves over time
• There is no strong evidence that wearing an abdominal support speeds recovery of rectus abdominis separation in postnatal women
• Wearing an abdominal support postnatally reduces bother associated with rectus abdominis diastasis more than not doing so

Ethics Approval: The study protocol was reviewed and ethically approved by both the Hawkesbury Research Ethics Committee (HREC) of Northern Sydney Central Coast Health (NSCCH) and the ethics committee of Curtin University.

INNOVATIVE PERSONALISED LIFE-LONG LEARNING – HOW CAN YOU USE TWITTER FOR YOUR PHYSIOTHERAPY PROFESSIONAL DEVELOPMENT?

Cran F
Greater Dandenong Community Health Service, Springvale

Introduction: There has been a huge growth in social media worldwide, including twitter use amongst clinical physiotherapists, researchers, academics and students. Twitter is a platform for communication and connection – an individual can respond socially and personally, or an organisation as a business marketing strategy. However, It can also have vast professional benefits as a conduit to “on-demand personal learning” or real-time advice. Twitter communicates via tweets – short messages of up to 140 characters (letters, spaces or numbers), but these may signpost journal articles, blogs or further discussions so communication can extend beyond the superficial.

Objective: To explore how physiotherapists are using twitter to meet educational needs, share participant’s findings, and encourage additional educational twitter uptake for different voices and richer discussion. Issues/Ideas for discussion: Usefulness – What are the benefits? What ways of engaging with twitter might meet individual learning needs and situations? What outcomes do you expect to achieve? Practicality – What are the challenges to effective and efficient twitter use? How can we avoid pitfalls? Applicability – How can participants begin or experienced users refine existing twitter habits? Do first impressions count? What does these all the jargon mean – following, retweet, hashtags, tweet chats?

Practice Points:
• Be selective with your knowledge stream – find “thought leaders”, a breadth and diversity of opinion that challenges your biases, reflect and apply critical thought
• Follow AHPPA and your employer’s Guidelines and observe before expressing your opinions
• Know your purpose and be strategic – listen, engage and debate, inform and share.

A RANDOMISED CONTROLLED TRIAL OF TARGETED PHYSIOTHERAPY FOR PATELLOFEMORAL OSTEOARTHRITIS

Crossley K1, Vicenzino B1, Lentzos J2, Schache A2, Pandy M2, Hinman R3
1The University Of Queensland 2The University of Melbourne

Question: Despite the burden of patellofemoral osteoarthritis (PFJOA), there is limited evidence for effective, compartment-specific interventions. This project evaluated whether physiotherapy, targeted to the PFJ, resulted in greater improvements in pain and physical function than physiotherapy-led education.

Design: Randomised, blinded controlled trial

Participants: Ninety-two people, ≥40 years with PFJ- associated with rectus abdominis more than not postnatal support speeds recovery of rectus abdominis separation in postnatal women

Wearing an abdominal support postnatally reduces bother associated with rectus abdominis diastasis more than not doing so

Twitter communicates via tweets – short messages of up to 140 characters (letters, spaces or numbers), but these may signpost journal articles, blogs or further discussions so communication can extend beyond the superficial. Purpose: To explore how physiotherapists are using twitter to meet educational needs, share participant’s findings, and encourage additional educational twitter uptake for different voices and richer discussion. Issues/ Ideas for discussion: Usefulness – What are the benefits? What ways of engaging with twitter might meet individual learning needs and situations? What outcomes do you expect to achieve? Practicality – What are the challenges to effective and efficient twitter use? How can we avoid pitfalls? Applicability – How can participants begin or experienced users refine existing twitter habits? Do first impressions count? What does all the jargon mean – following, retweet, hashtags, tweet chats?

Practice Points:
• Be selective with your knowledge stream – find “thought leaders”, a breadth and diversity of opinion that challenges your biases, reflect and apply critical thought
• Follow AHPPA and your employer’s Guidelines and observe before expressing your opinions
• Know your purpose and be strategic – listen, engage and debate, inform and share.
Outcomes Measures: (i) patient perceived global rating of change (GROC); (ii) pain (100mm VAS); and (iii) activities of daily living (ADL), subscale of the Knee injury and Osteoarthritis Outcome Score (KOOS) at 3 months. GROC was dichotomised and expressed as relative risk reduction and numbers needed-to-treat (NNT). Continuous outcome measures were evaluated with linear regression models.

Results: Participants were matched for demographic characteristics (Physiotherapy: 56±10 yrs, BMI 27±4.0 m.kg⁻²; 45% female; Education: 53±10 yrs, BMI 27.9±4.6 m.kg⁻²; 55% female). Targeted physiotherapy resulted in more people reporting marked improvement than the education group (relative risk 4.31; 95% CI 1.19 to 13.63; NNT 3 (95% CI 2 to 5), greater reduction in mean knee pain (mean difference: 15.2 mm, 95% CI 3.4 to 27), but no effect on the KOOS-ADL (mean difference: 6; 95% CI -1 to 12).

Conclusion: Physiotherapy intervention, targeted to the PFJ, resulted in superior outcomes for patient perceived change and pain than physiotherapy-led education.

Key Practice Points:
• Patellofemoral OA is burdensome, yet few interventions have evaluated the effectiveness of targeted interventions for this subgroup of people with PF OA.
• Physiotherapy, targeted to the PFJ can result in pain reductions that are likely to be clinically meaningful.
• Physiotherapy interventions to the compartment most affected by the disease.

SYSTEMATIC REVIEW OF THE LITERATURE ON ABDOMINAL AND MULTIFIDUS MUSCLE FUNCTION, ASSESSMENT METHODS AND THEIR MEASUREMENT RELIABILITY IN OLDER ADULTS

CueLLAR WA 1,2, Wilson A 1, Jones G 3, Blizzard L 1, Julie Hides 3, Winzenberg T 1
1Menzies Research Institute Tasmania, University of Tasmania, Hobart
2School of Medicine, University of Tasmania, Hobart
3Australian Catholic University

Question: What is known about abdominal and multifidus muscle size, including validity, reliability and their relationship to functional outcomes in older adults?

Design: Systematic review of quantitative studies.

Participants: Adults aged over 50 years.

Outcome Measures: Electromyographic (EMG), ultrasound (US), magnetic resonance imaging (MRI) and computerised tomographic (CT) measurements of rectus abdominis, internal and external oblique, transversus abdominis and lumbar multifidus muscles, their measurement reliability and validity, and associations with other factors.

Results: 28 studies with 2812 participants (median 41, range (±two) years post-anterior cruciate ligament reconstruction; 18 with radiographic patellofemoral osteoarthritis, and 18 with no knee osteoarthritis.

Outcome Measures: Knee internal-external rotation angles were measured in a gait laboratory using a three-dimensional motion analysis system (VICON) during walking and running. Weight-bearing frontal plane knee alignment was measured with a digital inclinometer, and participants were classified as having either varus or valgus alignment using previously validated criteria.

Results: Significant interactions were found between patellofemoral osteoarthritis and frontal plane alignment on knee internal-external rotation angle on knee internal-external rotation during walking and running (p = 0.005). Post-hoc tests revealed that in individuals with valgus alignment, those with patellofemoral osteoarthritis demonstrated a mean 5° (95% CI: 0 to 10) less knee internal rotation than those without osteoarthritis across both gait speeds. For individuals with varus alignment, no significant differences were observed.

Conclusion: Less knee internal rotation was found in those with patellofemoral osteoarthritis and valgus aligned knees. This may be clinically important, considering that a rotational shift of this magnitude may be sufficient to initiate or accelerate patellofemoral cartilage degeneration. Prospective studies are required to determine if these altered movement patterns result from structural degeneration in the patellofemoral joint, or if they contribute to patellofemoral osteoarthritis development after reconstruction.

Key Practice Points:
• These findings may help to explain the high prevalence of patellofemoral osteoarthritis after anterior cruciate ligament reconstruction.
• Rehabilitation programs should aim to optimise knee rotational biomechanics following anterior cruciate ligament reconstruction.
• Further studies are required to determine if these altered biomechanics are a cause or effect of patellofemoral osteoarthritis.

CAN KNEE OSTEOARTHRITIS OCCUR AS EARLY AS ONE YEAR AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION? A MAGNETIC RESONANCE IMAGING EVALUATION

Culvenor AG 1, van Leeuwen J 2, Beck N 1, van Middelkoop M 3, Bierna-Zeinstra SM 4, Oei EH 5, Crossley KM 6
1School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane
2Department of Mechanical Engineering, The University of Melbourne, Parkville
3Department of Physiotherapy, Monash University, Melbourne

Questions: What is the prevalence of tibiofemoral and patellofemoral osteoarthritis, and associated structural features, one year after anterior cruciate ligament reconstruction using MRI? How reliable is the recently proposed assessment tool: the MRI Osteoarthritis Knee Score (MOAKS)?

Design: Observational.

Participants: One hundred and fifteen individuals (mean age 30 years) who were approximately one year after anterior cruciate ligament reconstruction.
Outcome Measures: High-field 3Tesla MRI was performed and the MOAKS was used to score specific features of osteoarthritis and to evaluate the prevalence of tibiofemoral and patellofemoral osteoarthritis based on published criteria.

Results: Prevalence of bone marrow lesions in the medial and lateral tibiofemoral and patellofemoral compartments were 63%, 47% and 30%, respectively, with articular cartilage lesions (20%, 16% and 35%), osteophytes (30%, 27% and 63%) and meniscal damage (31%, 31% and 31%) also frequently observed in all compartments. Sixteen participants (14%) met the MRI criteria for tibiofemoral osteoarthritis, whilst 10 (9%) met patellofemoral osteoarthritis criteria. Most measures of inter-rater reliability from the MOAKS were substantial (81% of kappa values > 0.6).

Conclusion: Features of tibiofemoral and patellofemoral osteoarthritis defined from MRI criteria in this population of young adults were evident as early as one year following anterior cruciate ligament reconstruction. Although osteoarthritis features were frequently observed, the stability of these features, particularly bone marrow lesions, which may resolve or progress over time, is not well understood. Inter-rater agreement using the MOAKS was high suggesting the MOAKS may be used in the early stages of osteoarthritis disease.

Key Practice Points:
- Osteoarthritis features are frequently observed as early as one year following anterior cruciate ligament reconstruction.
- The MOAKS is a reliable tool to evaluate knee osteoarthritis in the early stages of disease.
- The patellofemoral joint does not escape the effect of anterior cruciate ligament injury or reconstruction.

A SYSTEMATIC REVIEW OF INSTRUMENTS FOR THE ASSESSMENT OF PROFESSIONAL COMPETENCE OF PHYSIOTHERAPY STUDENTS

Daly AE
1 Austin Health, Studley Road, Heidelberg, Victoria

Question: What instruments are currently available to assess the professional competence of physiotherapy students and what are their training requirements? What is the evidence for validity, reliability and feasibility of these instruments? Design: Systematic review of studies describing the development, evaluation and psychometric properties of instruments to assess the professional competence of physiotherapy students.

Participants: Studies of undergraduate, graduate-entry or post-graduate students of any tertiary institute or registration body offering a physiotherapy qualification or re-registration.

Outcome Measures: Instruments were examined for evidence of validity, reliability and feasibility based on test content, response processes, internal structure, relations to other variables and educational impact.

Results: 25 studies reporting 11 instruments met inclusion criteria. The instruments differed in number of items, type of rating scale, and scoring criteria, but content was similar. The Clinical Performance Instrument (CPI) and the Assessment of Physiotherapy Practice (APP) have the most evidence supporting validity, reliability and measurement properties. Limited information on training requirements for instrument use was provided and only one study (APP) investigated the presence of bias in assessor ratings. No studies investigating assessment for re-registration or post graduate specialization were found.

Conclusion: Eleven instruments are available for the assessment of physiotherapy students in clinical practice. While differences in instrument items and scoring criteria were identified, instruments exhibited homogeneity in professional practice domains. Two instruments from USA and Australia have acceptable evidence of validity and reliability and have been widely adopted within the countries in which they were developed.

Key Practice Points:
- Assessment instruments need to be tailored to the standards of each individual country
- Assessment instruments from Australia and the United States of America have sufficient evidence of validity and reliability
- Insufficient evidence on appropriate training of assessors which is the key component to best practice in workplace based assessment, is provided.

HOW TO SUCCESSFULLY INTEGRATE A PAIN MANAGEMENT APPROACH INTO AN AQUATIC PHYSIOTHERAPY PROGRAM

Daly AE
1 Austin Health, Studley Road, Heidelberg, Victoria

Introduction: Persistent pain requires a different treatment paradigm to acute or subacute pain. The aquatic environment is often utilised by people with persistent pain, as they may feel more able to exercise comfortably in the warmth and buoyancy of water. This presentation aims to explain strategies that can be adapted by aquatic physiotherapists to provide evidence based, outcome driven interventions for clients with persistent pain.

Discussion: While compassion and empathy are key traits of the successful pain’ clinician, there must also be a contract of open and honest communication and collaboration, with therapist and client, and this occurs in the arrangement that the therapist’s role changes from healer to coach and the client’s role from passive receiver to active participant. Comprehensive land based assessment, including the formulation of SMART goals, should occur prior to the commencement of a water-based program. The mode of delivery and progression of the water-based program should reflect graded time contingencies rather than...
Physiotherapists can currently refer directly into ‘Network’ Pain Management Programs (PMPs), thereby improving access to treatment for injured workers. These improvements were greatest when workers attended a targeted ‘Network’ PMP and as one potential solution, Physiotherapists can now refer compensable clients directly to Network PMPs.

Key Practice Points:
- Treatment methodology for persistent pain is different from that for acute and subacute pain
- Evidence-based pain management treatment principles can be successfully utilised by aquatic physiotherapists for their clients with low back pain
- Goal setting, open communication, collaboration, and time contingent progression are paramount in the pain management setting

DO PAIN MANAGEMENT PROGRAMS KEEP WORKING FOR COMPENSABLE PATIENTS? A THREE YEAR FOLLOW UP

Daly A
WorkSafe Victoria and the Transport Accident Commission

Questions: Does attendance at a targeted ‘Network’ Pain Management Program (PMP) have a long term effect on the clinical and occupational outcomes for injured Victorian workers? How does this compare with the outcomes of other PMPs?

Design: Observational study.
Participants: 311 injured Victorian workers who participated in a Network PMP and 417 injured Victorian workers who participated in other PMPs.

Outcome Measures: Brief Pain Inventory (BPI), Fear Avoidance Beliefs Questionnaire (FABQ), Global Impression of Change, client satisfaction, medication utilisation and scheme related costs were tracked for up to 3 years.

Results: Improvements (p < .001) were noted on the BPI pain interference scale (mean 1.7, SD 2.5), the FABQ work scale (mean 3.2, SD 7.7) and physical activity scale (mean 5.2, SD 6.4). Medication usage reduced from 60% of injured workers to 35%, for other PMPs, usage was relatively unchanged. The average costs for injured workers who participated in a ‘Network’ PMP were 33% lower than those who participated in other PMPs.
‘Network’ PMPs resulted in improved RTW outcomes for workers when compared with other PMPs. 92.5% of clients reported improvement on the Global Impression of Change and 94% were satisfied with their Network PMP. On average 1.9 years elapsed from injury to assessment for a ‘Network’ PMP.

Conclusion: ‘Network’ PMPs provided important and sustained benefits for injured Victorian workers. These benefits were superior to those of other PMPs. Timely access remains a problem and as one potential solution, Physiotherapists can now refer compensable clients directly to Network PMPs.

Key Practice Points:
- Participation in a Pain Management Program resulted in improvements in clinical and occupational outcomes, sustained for up to 3 years, for injured Victorian workers.
- These improvements were greatest when workers attended a targeted ‘Network’ Pain Management Program.
- Physiotherapists can currently refer directly into ‘Network’ Pain Management Programs.

DO DIMENSIONS OF SENSATION DIFFER BETWEEN INDIVIDUALS WITH AND WITHOUT OVERACTIVE BLADDER? A PILOT STUDY

Das R, Buckley J, Williams MTW1,2
1Nutritional Physiology Research Centre, School of Health Sciences, University of South Australia, Adelaide
2School of Population Health, University of South Australia, Adelaide

Questions: Which items within a test battery assessing multiple dimensions of ‘desire to void’ sensation are reliable and discriminate between people with and without overactive bladder?

Design: Prospective repeated-measures observational study.
Participants: Forty six female and 18 male volunteers, mean age 62 years, approximately half with overactive bladder according to the overactive bladder symptom score and awareness tool attended two testing sessions approximately two weeks apart.

Outcome Measures: The test battery assessed the sensation ‘desire to void’ in terms of sensory quality (volunteered descriptors), intensity, unpleasantness, suddenness, ability to ‘hold on’ and bladder fullness (via visual analogue scales) and location via body chart. Random effects mixed modelling assessed test-retest reliability and partial least squares regression assessed which items discriminated according to overactive bladder status.

Results: Most items were reliable between occasions except visual analogue ratings for intensity and fullness (p = 0.002 and p = 0.017) and body chart markings of genitalia (p = 0.05). Participants with overactive bladder were twice as likely to volunteer words from the ‘urgency’ descriptor category and three times less likely to volunteer words from the ‘fullness’ category, and reported higher ratings for intensity, unpleasantness, suddenness and difficulty holding on (p ≤ 0.001).

Conclusion: Most dimensions of ‘desire to void’ sensation are stable over at least two weeks and specific dimensions delineate between individuals with and without overactive bladder.

Key Practice Points:
- Most dimensions of sensation are stable over a 2 week period.
- The sensation of desire to void differs between people with and without overactive bladder in multiple dimensions.
- Description of sensation with words from ‘urgency’ versus ‘fullness’ language categories may discriminate between those with or without overactive bladder.

BADLY BEHAVED BLADDER

Das R
Urinary urgency, the cornerstone symptom of overactive bladder, is common, troublesome and notoriously difficult to treat. The 2002 International Continence Society definition of urgency sparked debate regarding the nature of the sensation, revealing that whilst many health care providers exist there is little scientific data to support any one theory regarding the nature of urgency. How the sensory experience of urgency differs from the normal desire to void is not known. This presentation will outline the evolution of theories regarding the cause and nature of urinary urgency, drawing parallels with research into other adverse sensation such as pain and dyspnoea. The results of recent research will be presented, including a systematic review investigating the history of urgency measurement and an observational study which has, for the first time, provided evidence that the sensation of desire to void experienced by people with symptoms of overactive bladder differs from that experienced by asymptomatic individuals in multiple dimensions.
DOES ENGLISH PROFICIENCY IMPACT ON HEALTH OUTCOMES FOR INPATIENTS UNDERGOING STROKE REHABILITATION?

Davies SE¹,², Dodd K¹, Hill K¹, Tu A¹, Zen S¹, Zucchi E¹
¹Northern Health, Melbourne
²La Trobe University, Melbourne

Questions: Does English proficiency impact on health outcomes for inpatients undergoing stroke rehabilitation? Does the frequency of interpreter use impact on these outcomes?

Design: Retrospective case control study.

Participants: People admitted with a primary diagnosis of stroke to participating inpatient rehabilitation hospitals within the study period were included. Participants were categorised into two groups based on their preferred language. Group 1 comprised people with native or near native English proficiency. Group 2 comprised people with low English proficiency who were likely to require an interpreter. Participants from Group 1 were matched for age (+/- 3 years) and gender with those from Group 2.

Outcome Measures: Retrospective data on length of stay, discharge function and function and independence measures (FIM) were gathered from patient electronic medical records between 25/09/2008 and 07/05/2012.

Results: Participants in the two groups were similar for most of the measures of premorbid level of function (p<0.05), however Group 1 had a small but significantly greater number of comorbidities at time of admission than Group 2 (p<0.02). Group 2 showed a greater improvement in total FIM from admission to discharge (p<0.04). No significant differences were found between groups in length of stay, discharge destination and time spent in allied health therapy. Frequency of interpreter usage also did not significantly alter these outcomes.

Conclusion: English proficiency and frequency of interpreter usage do not appear to impact on length of stay in inpatient rehabilitation, discharge destination or FIM at discharge for people with stroke undergoing inpatient rehabilitation.

Key Practice Points: People with low English proficiency undergoing inpatient stroke rehabilitation achieved similar outcomes to those with native or near native proficiency irrespective of frequency of interpreter usage. Further research is required to investigate the formal and informal factors supporting these positive outcomes as well as patient satisfaction and active participation in therapy.

ARE CLINICAL MANIFESTATIONS OF DISRUPTED CORTICAL MAPS PRESENT IN PATIENTS WITH CHRONIC, MID-PORTION ACHILLES TENDINOPATHY?

Debenham J¹,², Wand B¹, Butler P³, Mallows A³, Gibson W³
¹University Of Notre Dame
²Curtin University
³University of Essex

Question: Are clinical manifestations of disrupted cortical maps present in patients with chronic, mid-portion Achilles tendinopathy (AT)?

Design: Case controlled repeated measures cohort study.

Participants: Thirteen patients with chronic mid-portion AT and 13 healthy controls.

Outcome Measures: Two-point discrimination threshold (TPD) was measured on the affected and unaffected Achilles tendons. A computer-based laterality recognition task was performed using images of feet and hands. Condition severity was measured using the Victorian Institute of Sport Achilles questionnaire.

Results: TPD was significantly worse on the affected side of patients with Achilles tendinopathy compared with their unaffected side (mean 11.7 mm, 95% CI 11.9 to 21.5, p = 0.02), and also healthy controls (mean 13.1 mm, 95% CI 1.6 to 24.6, p = 0.03). Laterality recognition time was significantly faster on the affected foot when compared with healthy controls (mean -0.68 seconds, 95% CI -0.39 to 0.97, p = 0.00). No difference was observed in laterality recognition accuracy between the affected side and the unaffected side (p = 0.36), upper limb control (p = 0.26), or healthy control (p = 0.80). Likewise, no differences were observed in laterality recognition time between the affected side and the unaffected side (p = 0.56) or the upper limb (p = 0.01).

Conclusion: These data provide the first evidence of the presence of cortical dysfunction in patients with chronic AT. This supports supplementary pathoetiological mechanisms in this complex multifactorial condition. In addition, it suggests that amelioration of these abnormalities may be a novel therapeutic target.

PROMOTING RESILIENCE TO ENHANCE PHYSIOTHERAPY CLINICAL LEARNING AND PERFORMANCE: AN ACTION RESEARCH PROJECT

Delany CM, McLeod S, Miller K, El Ansary D, Remedios L, Hoseini A

Question: Can a program to build resilience skills improve clinical placement learning experience and performance for physiotherapy students?

Design: Action Research Methodology.

Participants: Six final year undergraduate Physiotherapy students from two Victorian Universities.

Intervention: Students attended four 1.5 hour action research sessions led by a clinical health psychologist. Resilience concepts and strategies drawn from cognitive behavioural therapy and positive and performance psychology were introduced. Students; 1) identified specific clinical learning challenges; 2) developed resilience based strategies to address them, and 3) trialed and evaluated the impact on their clinical learning performance.

Outcome Measures: The action research sessions were audio-recorded and transcribed. Two researchers separately coded and thematically analysed this data for examples of learning challenges and related resilience dimensions. In addition, students’ de-identified diary notes documents strategies they trialed and their impact on learning and clinical performance, were coded and analysed.
**Limited effect of inhibitory taping on upper trapezius muscle activity during a standardized typing task**

Takasaki H1, Delbridge B1, Johnston V1

1Division of Physiotherapy, School of Health and Rehabilitation Science, The University of Queensland, Brisbane

**Question:** What is the effect of taping across muscle fibres with tension (inhibitory taping) on muscle activity of the upper trapezius (UT) during a standardised typing task?

**Design:** Assessor-blinded randomised cross-over trial with concealed allocation, assessor blinding and intention-to-treat analysis.

**Participants:** Forty-two healthy volunteers.

**Intervention:** Over three separate sessions, participants were randomly allocated to either of three intervention conditions following a baseline 15-minute typing task: taping applied perpendicular to the UT fibres with tension (inhibitory taping); taping perpendicular to the UT without tension (proprioceptive taping), and no taping. Myoelectric data of the dominant side UT was collected with surface electromyography (EMG).

**Outcome Measures:** EMG data were analysed using 10% Amplitude Probability Distribution Function (10%APDF) during the last 10 minutes of typing. The change of muscle activity during the intervention conditions from each baseline measurement was compared.

**Results:** The Friedman test demonstrated statistically significant differences in the change of 10%APDF between the three intervention conditions (p = 0.03). However, compared with the changes in the no taping condition, neither taping condition revealed statistically significant differences (p = 0.07-0.18) and each effect size was small (r = 0.21–0.23). No significant change in the 10%APDF was detected between the two taping conditions (p = 0.92, r = 0.02).

**Conclusions:** Taping across the UT changed its muscle activity during a standardised typing task in healthy participants. However, its effect was not large, thus limiting the usefulness of taping to prevent over-activity of the UT during computer use.

**Trial registration:** ACTRN12612000074897.

**Key practice points:**

- Taping has a small impact on muscle activity in healthy individuals.
- Inhibitory and proprioceptive taping compared with no taping has no difference in UT muscle activity in healthy individuals.
- Taping may not be a useful therapeutic intervention for prevention of neck/shoulder pain in office workers who are performing continuous typing.

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**Intra and inter-rater agreement of lumbar palpation technique for diagnosis of vertebral rotation**

Nunes GS1, Bracht MA1, Schwertner DS1, Celestino J1, de Noronha M1 2, França LF1

1Universidade do Estado de Santa Catarina – Florianopolis – Brazil
2La Trobe University, La Trobe Rural Health School – Bendigo

**Question:** Does the diagnosis of lumbar vertebral rotation by palpation have acceptable intra and inter-rater agreements?

**Design:** Test-retest agreement investigation.

**Participants:** We recruited 51 volunteers within the university community who had a mean (SD) age of 23±5.6 years.

**Outcome Measures:** The level of agreement between and within raters was investigated using Cohen’s kappa coefficient (κ) in which k < 0.2 is considered weak. For that, participants were assessed in two separate sessions by three raters in each session. Two of the raters had over 10 years of experience in manual therapy and one had less than 1 year of experience. The interval between sessions varied from 30 to 60 minutes. The order in which raters assessed participants was randomised and raters assessed vertebral rotation in the coronal plane by using the “motion asymmetry” technique, which gave them a means to classify vertebral rotation as neutral, right rotation or left rotation.

**Results:** We used the first session results to calculate the inter-rater agreement. The inter-rater agreements varied from κ = 0.12 (95% CI 0.04 to 0.39) to κ = 0.24 (95% CI 0.08 to 0.52) and the intra-rater agreement varied from κ = 0.07 (95% CI -0.06 to 0.41) to κ = 0.34 (95% CI 0.11 to 0.63).

**Conclusion:** The results are in agreement with previous studies and show that detection of lumbar vertebral rotation by palpation has overall weak intra and inter-rater agreement, therefore it is not useful for diagnosing lumbar vertebral rotation.

**Key Practice Points:**

- The “motion asymmetry” technique is not useful for establishing lumbar vertebral rotation.
- Using “motion asymmetry” to guide treatment can lead clinicians to inappropriate treatment.
- Improved manual techniques that can reliably diagnose lumbar vertebral rotation are needed.

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**Do children with developmental coordination disorder power gait the same way as typically developing children?**

Diamond N, Downs J, Morris S

**Background:** Children with Developmental Coordination Disorder (DCD) often have difficulties running. This study compared strategies of power generation at the ankle during normal walking, fast walking, jogging and sprinting in children with and without DCD.

**Methods:** Eleven children (six male) aged nine to 12 years with DCD were matched by sex and age with 11 typically developing (TD) children. Gait kinematics and kinetics were measured during normal walking, fast walking, jogging and sprinting using three-dimensional motion analysis. Propulsion strategy during gait was calculated as ankle power divided by the sum of ankle and hip power (A2/A2+H3).

**Results:** The children with DCD ran slower than the TD children (mean difference [MD] jog 0.3m/s; sprint 0.6m/s). Adjusting for speed, those with DCD had smaller propulsion strategy values during jogging (p = 0.001) and sprinting (p = 0.012), explained by reduced ankle power generation at push off (A2) (jogging, MD 2.5W/kg, p = 0.001) and greater hip flexor power generation at pull off (H3) (jogging, MD 0.75W/kg, p = 0.013). Similar findings were observed during sprinting.

**Conclusions:** Children with DCD ran with a slow and less efficient running style, consistent with developmental immaturity. Physiotherapy targeting running-specific needs in relation to ankle muscle strength and coordination could enable more participation in running activities.
CONTRACTURE AFTER SPINAL CORD INJURY: ARE WE MOVING FORWARD?

Diong J

Contracture, the loss of joint range of motion, is thought to be a common complication after spinal cord injury. However there are few reliable data on the epidemiology of contracture and the mechanisms of contracture remain unclear. The aims of this series of studies were to determine the incidence and predictors of contracture, and identify the mechanisms of contracture after spinal cord injury.

To determine the epidemiology of contracture, a prospective cohort study was conducted where consecutive patients presenting with an acute spinal cord injury to the two main spinal units in NSW were recruited. Passive range of motion in all appendicular joints was measured soon after injury and one year later. The ankle and shoulder joints were most commonly affected by contracture. More than 60% of participants developed at least one joint contracture. None of the potential predictors were identified as clinically useful predictors of contracture.

To determine the mechanisms of contracture, a novel biomechanical method was applied at the ankle in combination with ultrasound measures of muscle fascicle length to determine the length-tension properties of the gastrocnemius muscle in participants with spinal cord injury and ankle contracture, compared to able-bodied control participants. The gastrocnemius muscle-tendon unit in participants with spinal cord injury who had ankle contracture was stiffer compared to control participants, but it is not known whether the increased stiffness was due to the muscle fascicles or tendon. Conversely, compliance of the hamstring semimembranosus muscle fascicles and tendon were examined with ultrasound imaging in participants with spinal cord injury who had increased hamstring muscle extensibility compared to able-bodied control participants. The contribution of muscle fascicles to muscle-tendon compliance was similar in participants with spinal cord injury and control participants, indicating the increased hamstring muscle-tendon compliance was due, in part, to increased tendon compliance.

In summary, it is now clear that contracture is common after spinal cord injury. The gastrocnemius muscle-tendon unit is stiffer in people with spinal cord injury who had ankle contracture however the contribution by muscle fascicles or tendon to contracture remains unclear.

RECOMMENDED PERFORMANCE-BASED TESTS TO ASSESS PHYSICAL FUNCTION IN PEOPLE DIAGNOSED WITH HIP OR KNEE OSTEOARTHRITIS

Dobson F1, Himman RS1, Roos EM2, Abbott JH2, Bennell KL3

1Centre for Health, Exercise and Sports Medicine, Department of Physiotherapy, School of Health Sciences, The University of Melbourne, Melbourne
2Institute of Sports Science and Clinical Biomechanics, University of Southern Denmark, Denmark
3Centre for Musculoskeletal Outcomes Research, Department of Surgical Sciences, Dunedin School of Medicine, University of Otago, New Zealand

Questions: Which performance-based tests of physical function for people diagnosed with hip or knee osteoarthritis should clinicians and researchers use?

Design: Systematic review of measurement properties and consensus-based decision analysis.

Participants: An advisory group of 10 International, multidisciplinary osteoarthritis experts (median experience: 20 years; IQR 12-28) was established to guide the study. Consensus incorporated the opinions of a further 138 clinicians/researchers from 16 countries (median osteoarthritis experience: 10 years; IQR 5-18).

Outcome Measures: Performance-based tests were ranked using online decision analysis surveys (1000Minds software). The recommended tests were chosen based on available measurement-property evidence, feasibility of the tests, scoring methods and expert consensus.

Results: The five tests recommended by the advisory group were the 30-second chair stand test, 40m fast-paced walk test, a stair climb up and go test and six-minute walk test. The first three were recommended as the minimal core set of performance-based tests for hip or knee osteoarthritis. The tests were endorsed by the Osteoarthritis Research Society International and full descriptions are available on their website: www.orsi.org.

Conclusion: The recommended performance-based tests of physical function represent tests of typical activities relevant to individuals diagnosed with hip or knee osteoarthritis and following joint replacements. These tests are complementary to patient-reported measures and are suggested as prospective outcome measures in future osteoarthritis research and to aid clinical decision making. Further research should be focused on expanding the measured outcome property evidence of the recommended tests.

Key Practice Points:

• Recommended test are: 30-second chair stand test, 40m fast-paced walk test, stair climb test, timed up and go test and six-minute walk test.
• Recommendations may facilitate more consistent use of outcome measures in clinical trials and practice.
• Further research is required to expand the clinimetric evidence of the recommend tests.

IMPROVEMENT IN ACHILLES TENDON STRUCTURE IN ELITE AUSTRALIAN FOOTBALL PLAYERS DURING PRESEASON TRAINING

Docking S1, Rosengarten SD3, Cordy JT2, Cook JL1

1School of Physiotherapy, Monash University, Frankston
2Carlton Football Club, Melbourne

Questions: Does the structure of the Achilles tendon change over the course of a preseason in elite Australian football players?

Design: Prospective observational study.

Participants: 18 elite Australian football players undertaking preseason training were recruited. These participants had no current or previous history of Achilles tendinopathy.

Outcome Measures: Participants were scanned using ultrasound tissue characterisation (UTC), which captures 3D contiguous transverse ultrasound images and renders a 3-dimensional image. UTC-dedicated algorithms quantify the stability of brightness into four echo-types that have been validated against pathological specimens.

Results: Three participants were excluded from the study as they developed Achilles tendinopathy symptoms. Significant increases in echo-type I, which represent correctly aligned secondary fasciculi, were observed at the over the length of the preseason (p = 0.001). Reductions in echo-type II, III and IV (p = 0.001, 0.001 & 0.003, respectively) that represent varying degrees of fibrillar disorganisation were observed, indicating that tendon structure has improved.

Conclusion: This is the first study to quantify the tendon structure of the Achilles over the course of a preseason. The results show that the structure of the Achilles tendon responds positively to increases in load in individuals who have no history of Achilles tendinopathy. Further research is required to understand the other factors that contribute to the development of tendinopathy. As a sports-based loading program appears to be beneficial to tendon structure.

Key Practice Points:

• The Achilles tendon is a mechanoresponsive tissue that responds to load.
• If loaded in the correct way, the Achilles tendon will respond positively and structure may improve.
• UTC has the capacity to monitor and quantify tendon structure in high loading environments.

STRATEGIES USED TO STAND UP: COMPARISONS BETWEEN OLDER PEOPLE WITH AND WITHOUT DEMENTIA

Dolecka U1, Ownsworth T2, Kuys SS3

1Senior Physiotherapist, Acute Aged Care and Cancer Services, Princess Alexandra Hospital, Brisbane
2School of Applied Psychology, Griffith University
3Principal Research Fellow, The Prince Charles Hospital and Griffith University

Questions: What sit to stand strategies are used by people with and without dementia? Do the number, type and order of strategies differ and does the presence of a table (30 cm in front) influence these strategies?

Design: Comparative, observational study.
Results: A similar starting position was used by people with and without dementia for hip and feet position. People with dementia tended to use more strategies (3 vs 2), started with their backs against the backrest less frequently (68% vs 37%) and pushed through their arms more frequently (65% vs 39%) than people without dementia. Leaning forward was the most commonly used strategy for both groups but it was less pronounced in dementia group. The use of a table in the front did not change the strategies used (Z-score = -0.85, p = 0.39).

Conclusion: People with and without dementia have some differences in how they stand up. People with dementia tended to use three strategies to stand up and relied more on pushing up through the arms. Presence of a table did not appear to have effect on choice of strategies.

Practice points:
- Leaning forward was the most common strategy but less pronounced in people with dementia
- People with dementia used their arms and used more strategies to stand up, suggesting that chairs with armrests should be provided
- The use of a table in front did not change the strategies used to stand up

SYSTEMATIC REVIEW OF RED FLAGS TO SCREEN FOR CANCER AND FRACTURE IN PATIENTS WITH LOW-BACK PAIN

Downie AS1, Williams CM1, Henschke N1, Hancock MJ2, Ostelo R3, de Vet HC4, Macaskill P5, Irwig LM5, van Tulder MW2, Koes BW6, Maher CG3
1The George Institute for Global Health, University of Sydney, Sydney
2Department of Health Professions, Faculty of Human Sciences, Macquarie University
3Department of Health Sciences, EMGO Institute for Health and Care Research, VU University, Amsterdam, Netherlands
4Department of Epidemiology and Biostatistics, EMGO Institute for Health and Care Research, VU University Medical Center, Amsterdam, Netherlands
5Screening and Test Evaluation Program (STEP), School of Public Health, Sydney
6School of Public Health, University of Sydney, Sydney
7Department of Health Sciences, EMGO Institute for Health and Care Research, VU University Medical Center, Amsterdam, Netherlands
8Department of General Practice, Erasmus Medical Center, Rotterdam, Netherlands

Question: What evidence supports red flags to screen for spinal fracture or cancer in patients presenting with low back pain?

Design: Comparison of the results of our two recent Cochrane reviews to recommendations in clinical practice guidelines.

Participants: Primary diagnostic studies comparing red flags for fracture or cancer to an acceptable reference standard in any language.

Intervention: N/A.

Outcomes: Four authors independently extracted study data and assessed the risk of bias of each study.

Results: 2,082 unique titles for malignancy and 11,457 for fracture were identified. Thirteen studies evaluating 49 red flags were included; with only five studies evaluating combinations of red flags. Prolonged corticosteroid use when present raised probability of fracture to 33% (95% CI 10 to 67). Red flags when applied in combination provided the largest increase in probability of fracture (three red flags present 90%, 95% CI 34 to 99).

Conclusion: Many red flags in current guidelines provide small changes in probability of fracture or cancer, or have untested diagnostic accuracy. Our results support (i) the use of a reduced set of red flags and (ii) consideration of probability of disease (given the specific red flags present) when making decisions about the need for, and timing of, further diagnostic work-up such as imaging.

Key Practice Points:
- Many red flags endorsed in clinical guidelines have poor or untested diagnostic accuracy.
- Older age, prolonged corticosteroid use, trauma or a combination of red flags increases the likelihood of spinal fracture.
- A previous history of cancer is the only informative red flag to screen for spinal cancer.

NORMAL VALUES OF THE BERG BALANCE SCALE IN HEALTHY ELDERLY PEOPLE: A SYSTEMATIC REVIEW

Downs S1, Marquez J2, Chiarelli P3
1Mid North Coast Local Health District
2The University of Newcastle

Questions: What is the mean balance of healthy elderly people, as measured by the Berg Balance Scale? How much does the balance of healthy elderly people vary with age?


Participants: Any group of healthy community-dwelling people with a mean age of 70 years or greater, that has undergone assessment using the Berg Balance Scale.

Outcome Measures: Mean and standard deviations of Berg Balance Scale scores within specific age cohorts of elderly people.

Results: The search yielded 18 relevant studies comprising 1,509 subjects. The mean Berg Balance Scale scores ranged from 37 to 55 out of a possible maximum score of 56. The standard deviation of Berg Balance Scale scores varied from 10 to 2.7. There was a strong association between increasing age and increasing variability in balance (p<0.001) and a decline in balance with age at a rate of 0.7 points on the Berg Balance scale per year.

Conclusion: Overall, healthy community dwelling elderly people have modest balance deficits, as measured by the Berg Balance Scale, although balance scores become more variable and deteriorate with increasing age.

Key Practice Point:
- Clinicians accustomed to working with unhealthy people may easily underestimate normal balance values of healthy elderly people.

Ethics approval: not required.

THE BERG BALANCE SCALE HAS HIGH INTRA- INTER-RATER RELIABILITY, BUT ABSOLUTE RELIABILITY VARIES ACROSS THE SCALE: A SYSTEMATIC REVIEW

Downs S1, Marquez J2, Chiarelli P3
1Mid North Coast Local Health District
2The University of Newcastle

Questions: What is the inter-rater and intra-rater relative reliability of the Berg Balance Scale? What is the absolute reliability of the Berg Balance Scale? Does the absolute reliability of the Berg Balance Scale vary across the scale?


Participants: Any group of healthy community-dwelling elderly people.

Outcome Measures: Relative reliability expressed in terms of intra-class correlation. Absolute reliability expressed in terms of minimal detectable change with 95% confidence.

Results: The search yielded 12 reliability studies included in the review. Meta-analysis found the relative intra-rater reliability of the Berg Balance Score is high, with a pooled estimate of 0.98 (95% CI 0.97 to 0.99). Relative inter-rater reliability is also high, with a pooled estimate of 0.97 (95% CI 0.96 to 0.98). The absolute reliability of the Berg Balance Scale varied across the scale, between 2.8 and 6.6 of a possible 56 points. We identified no data that estimated the absolute reliability of people with a Berg Balance scale of less than 20 out of 56.
**Conclusion:** The relative reliability of the Berg Balance Scale is high, while the absolute reliability varies across the scale.

**Key Practice Points:**
- The Berg Balance Scale has good relative reliability.
- The absolute reliability of the Berg Balance Score varies across the scale, being lower near the middle of the scale.
- Information about the absolute reliability of people with a Berg Balance Score of less than 20 out of 56 is lacking.

**Ethics approval:** not required.

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**SEDENTARY BEHAVIOUR AND HEALTH OUTCOMES**

**Dunstan D**

**Baker IDI Heart and Diabetes Institute**

Prolonged sitting has been engineered into our lives across many settings, including transportation, the workplace, and the home. While the implications for musculoskeletal health are widely acknowledged, there is new evidence that too much sitting (also known as sedentary behavior – which involves very low energy expenditure, such as television viewing and desk-bound work) is adversely associated with health outcomes, including cardio-metabolic risk biomarkers, type 2 diabetes, some cancers and premature mortality. In addition to the decreased energy expenditure induced through sitting, sedentary time may also be harmful because of the prolonged absence of muscle contractile activity in the lower limbs. Importantly, these detrimental associations remain even after accounting for time spent in leisure time physical activity. This new evidence from observational and experimental studies is beginning to make a strong case that too much sitting should now be considered as a potential new element of physical activity and health recommendations – particularly for reducing the risk of type 2 diabetes and cardiovascular disease.

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**CHANGES IN SLEEP TIME AND EFFICIENCY IN PROFESSIONAL RUGBY UNION PLAYERS DURING HOME BASED TRAINING AND GAMES**

**Eagles S, Hing W, Marsh D**

**Bond University**

**Question:** What are the changes in sleep time and efficiency in professional rugby union players during home based training and games?

**Design:** Descriptive observational study

**Participants:** A total of 10 super 15 rugby union players from a selected team, (height 185.22 ± 1.15cm), weight (100.78 ± 7.84kg), age (24.33 ± 2.60yrs) and years at professional level (4.22 ± 1.92yrs) participated in the study.

**Outcome Measures:** Athletes sleep quantity and efficiency was monitored over a 12 night period using the Bodymedia sensewear units. The collection period incorporated 2 home game fixtures and training days. Mean and Standard deviation for each night over the collection period was calculated for the playing group. Statistical analysis included a one way analysis of variance with 95% confidence intervals with the Bonferroni post hoc test to determine significant differences.

**Results:** Players sleep significantly (p<.05) less on game nights compared to non game night. Time to sleep on game nights was also significantly (p<.05) later than non game nights. There was no significant difference in sleep efficiency or time at wake over the 12 night period. Also there was no significant difference between sleep parameters on the game nights.

**Conclusion:** The findings show players have significantly (p<.05) reduced sleep following a home game, which is of concern considering the established negative influence of sleep deprivation on cognitive and physical performance.

**Key Practice Points:**
- Players sleep significantly less following a game
- Sleep efficiency is not influenced following a game
- Time at sleep was significantly later on game nights than non game nights
- Time at wake did not change significantly over the collection period
- There was no significant differences between the game nights

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**DEVELOPMENTAL OUTCOMES AND PHYSICAL ACTIVITY BEHAVIOUR IN CHILDREN POST MAJOR SURGERY COMPARED WITH A HEALTHY BIRTH COHORT**

**Dwyer GM**, **Walker K**, **Baur L**, **Badawi N**

1School of Science and Health, The University of Western Sydney
2Discipline of Paediatrics and Child Health, The University of Sydney

**Question:** Are developmental outcomes or physical activity behaviours different between term infants after major surgery compared with healthy control infants, at age three years?

**Design:** Prospective observational study

**Participants:** One hundred and thirty five children participated in the study. Sixty-eight children had major surgery in the first 90 days of life.

**Outcome Measures:** Developmental status was assessed using the Bayley Scales of Infant and Toddler Development, Third Edition (BSID-III). Physical activity and sedentary behaviour (small screen recreation i.e. TV and DVD viewing, plus computer usage) (SSR) were assessed using the Preschool-Age Physical Activity Questionnaire (Pre-PAQ). Activity was categorised as stationary (SSR) were assessed using the Preschool-Age Physical Activity Questionnaire (Pre-PAQ). Activity was categorised as stationary

**Results:** Both groups were within normal range across all domains of the BSID-III although the surgical group were significantly below the controls for cognition (z = -3.08; p<0.001) and receptive language (z = -3.51; p<0.001). Mean activity time for the surgery group was 190.6 mins.day⁻¹, and 185.3 mins.day⁻¹ for controls.

**Conclusion:** By age three, children who had major surgery in infancy, are developmentally normal but have not quite caught up with their peer group in cognitive and receptive language domains. Both groups meet recommended 3 hours of daily physical activity but exceed 60 minute SSR time recommended for preschool-age children.

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**CHARACTERISTICS OF ARTHRITIS AND OSTEOPOROSIS VICTORIA'S PEER LED WARM WATER EXERCISE PROGRAM – A MODEL THAT WORKS!**

**Eastham CB, de Silva RD, Nolan G**

**Introduction:** In today’s health environment it can be challenging to provide long term evidence-based, self-efficacious, but supported exercise programs for adults with chronic musculoskeletal conditions. Arthritis and Osteoporosis Victoria meet this challenge by providing a warm water exercise service in various hydrotherapy pools throughout Victoria.

**Discussion:** With over 1000 people participating each week, the goal of the program is to provide a service that facilitates self-help to people who share common chronic musculoskeletal health conditions. It aims to decrease the burden of chronic musculoskeletal and associated illness to the individual, the community, and the health care system, through physical activity and to support, promote and improve the well-being of participants. This presentation will showcase a peer-led, self-help model that has been reported to show high levels of physiological, psychological and social functioning, and can be both centrally
or locally coordinated. One of the main features is the use of volunteer leaders, many of whom have arthritis themselves. The support, understanding and social benefits from this, allow participants to exercise in an environment that is fun, beneficial and comfortable. Classes are intended to be affordable and part of a person’s ongoing exercise regime, for general fitness and mobility. All participants follow the same general exercise program as demonstrated by the leader, but they are encouraged to work at their own pace and within their own limits. Conclusion A peer-led warm water exercise program successfully provides physical and social benefits to adults with musculoskeletal conditions.

Key Practice Points:
• A peer-led, self-help model of warm water exercise classes
• Creating a supportive and affordable environment assists in continual and ongoing exercise
• Use of volunteers to assist to decrease the burden of chronic musculoskeletal conditions

SMALLEST WORTHWHILE EFFECT OF ULTRASOUND FOR SINUSITIS IN PEOPLE WITH CYSTIC FIBROSIS

Elkins MR1, Dentice RL1, O’Herlihy L2, Bye PTP2
1Royal Prince Alfred Hospital, Sydney, Australia
2Poole Hospital, Poole, UK

Question: What is the severity of sinusitis in people with Cystic Fibrosis (CF)? How much improvement in sinusitis symptom severity would make six treatments of ultrasound worthwhile for people with CF and sinusitis?

Design: Cross-sectional observational study with consecutive recruitment

Participants: Adults attending the RPA Hospital CF Clinic.

Outcome Measures: Upon routine presentation at the clinic, consenting participants completed the 22-item Sino-Nasal Outcomes Test (SNOT-22), generating a total score from 0 (no symptoms) to 110 (maximum symptoms). The participants were advised that their score was likely to be similar in 2 weeks with current therapy. A hypothetical treatment was then presented: six 18-minute treatments of ultrasound over the frontal and maxillary sinuses within 2 weeks, with costs, risks and inconvenience described in detail. Participants then nominated how much improvement in their score would make the proposed treatment worthwhile.

Results: Among the 110 patients invited, all consented and the mean SNOT-22 total score was 31 (SD 20). Sinus severity was considered too mild to be worth treating with ultrasound by 38 (35%) of the participants, who had a mean total SNOT-22 score of 20 (SD 13). The remaining 72 (65%) participants had a significantly higher mean score of 36 points (SD 20). Among this latter cohort, the mean smallest effect that would make the proposed treatment worthwhile was 15 points (SD 10) or 49% (SD 28).

Conclusion: Ultrasound can be considered worthwhile for CF-related sinusitis if the average effect is 15 points or more. PRF Grant T12-JN005.

Key Practice Points:
• The mean SNOT-22 score among adults with CF is 31 points (SD 20).
• 65% of adults with CF have sinusitis severe enough for them to consider additional treatment.
• Trials of ultrasound for CF-related sinusitis should be powered to identify an SNOT-22 effect of 15 (ie, the average smallest worthwhile effect).

INSPIRATORY MUSCLE TRAINING BEFORE CARDIOTHORACIC AND UPPER ABDOMINAL SURGERY TO PREVENT POST-OPERATIVE PULMONARY COMPLICATIONS: A SYSTEMATIC REVIEW

Mans C1, Reeve J2, Elkins M3
1Waikato District Health Board, Hamilton, New Zealand
2AUT University, Auckland, New Zealand
3University of Sydney, Sydney

Question: Does preoperative inspiratory muscle training improve respiratory muscle strength and endurance in adults undergoing cardiothoracic or upper abdominal surgery? Does the training prevent post-operative pulmonary complications and improve other post-operative outcomes?

Design: Systematic review with meta-analysis of randomised trials, identified with electronic searches of the Cochrane Library, PEDro, Medline, AMED, PsycINFO, Scopus and CINAHL.

Participants: People aged at least 16 years who were undergoing elective open cardiac, thoracic or upper abdominal surgery.

Intervention: Pre-operative inspiratory muscle training versus no/sham training.

Outcome Measures: Respiratory muscle function, post-operative pulmonary complications, length of stay, duration of mechanical ventilation, pulmonary function, oxygenation, time to first sit out of bed and to first ambulation, exercise tolerance, adverse events, quality of life, mortality and costs.

Results: Eight trials involving 296 participants met the inclusion criteria. Pooled data from the trials showed that inspiratory muscle training significantly increased inspiratory muscle strength pre-operatively (mean difference 15 cmH2O, 95% CI 9 to 21). This benefit was maintained in the early postoperative period. The training also reduced the incidence of postoperative pulmonary complications significantly (relative risk 0.48, 95% CI 0.26 to 0.89). Length of stay and most other outcomes showed favourable between-group differences but these were non-significant. One contributor to the reduction in pulmonary complications may have been the reduction in prolonged mechanical ventilation (relative risk of >24hr ventilation 0.18, 95% CI 0.04 to 0.77), although these data are from one study only.

Conclusion: Inspiratory muscle training reduces post-operative pulmonary complications in adults undergoing cardiothoracic or upper abdominal surgery.

Key Practice Points:
• Pre-operative inspiratory muscle training improves inspiratory muscle strength.
• The training also reduces the risks of prolonged mechanical ventilation and post-operative pulmonary complications.
• Further trials could help determine whether pre-operative inspiratory muscle training has a statistically significant effect on length of stay.
Audit Findings: EZPAP was effective in increasing lung volume in post-abdominal surgery patients, clearing secretions with fatigue patients who had ineffective coughs, preventing atelectasis in patients with neuromuscular disorders or limited by bed rest and as a positive pressure treatment to improve gas exchange. It has a place in all medical directorates including critical care and paediatrics and can be used for both acute and long term conditions.

Conclusion: EZPAP is an easy to use and effective physiotherapy adjunct for treating acute and chronic respiratory adult and paediatric patients within a DGH with a high compliance rate to treatment. Further Investigation is required for its use as a home or community therapy option.

SHOULD STUDENTS WORK WEEKENDS?

Elliott S
Medway NHS Foundation Trust

Relevance: Diversification of physiotherapy to provide a seven day service has been required to meet the changing needs of society and to reflect developments and competitive pressures in the health service as this increases productivity and reduces a patient’s length of stay. But there has been little consideration to examine how practically physiotherapists encompass seven day working for student placements.

Purpose: Before any models of clinical education are considered the question of “Should students work weekends and does it enhance the learning process” should be asked.

Description: This question was posed to peers on an interactive forum hosted by the Chartered Society of Physiotherapy (UK). Over 50 replies were posted from a wide range of students, graduates, clinical educators and managers.

Evaluation: The consensus appears that if the service has an established seven day service then students should work weekends as part of their clinical placements to prepare them for working as a newly qualified physiotherapist and to experience the differences of a hospital environment at a weekend. Students felt they were more employable if they had experienced weekend working and were more comfortable with on call working. However there should be some consideration to part time working as many students fund themselves through universities and also family commitments and childcare. The main concern raised was providing effective supervision if the educator and student did not have matching working patterns and that new models or formats should be sought.

Conclusions: Consideration to productivity, cost and quality of care and the students learning experience and the provision of supervision should all be taken into consideration if students are going to work weekends.

Implications: With the advent of seven day working and changing working patterns, there is a need to review student education.

DO STROKE SURVIVORS SPEND MORE TIME IN ACTIVE TASK PRACTICE IN CIRCUIT CLASS THERAPY SESSION VERSUS INDIVIDUAL PHYSIOTHERAPY SESSIONS?

English C1,2, Hillier S1, Kaur G1, Hundertmark L1
1International Centre for Allied Health Evidence, University of South Australia, Adelaide
2Stroke Division, Florey Institute of Neuroscience and Mental Health, Melbourne

Question: Do stroke survivors spend more time in active task practice and/or practice different tasks during circuit class therapy sessions versus individual physiotherapy sessions?

Design: Prospective, observational study.

Participants: 79 therapy sessions involving 29 stroke survivors in three inpatient rehabilitation settings.

Outcome Measures: Therapy sessions were video-recorded and the footage was analysed for time spent engaged in various categories of activity. In a subsample of 28 videos, numbers of steps taken by stroke survivors per therapy session were counted.

Results: Circuit class therapy sessions were of a longer duration (mean difference 38.0, 95% confidence interval (CI) 31.3 to 44.7 minutes), and participants spent more time engaged in active task practice (mean difference 23.8, 95% CI 17.8 to 29.8 minutes). A greater proportion of time in circuit class therapy sessions was spent practicing tasks in sitting (mean difference 5.1%, 95% CI 2.4 to 8.2%) and in sit to stand practice (mean difference 2.7%, 95% (1.0 to 4.4%) and a lesser proportion of time in walking practice (mean difference -19.1%, 95% CI -25.2 to -13.0%). Stroke survivors took an average of 371 (SD 418) steps during therapy sessions and this did not differ significantly between therapy types.

Conclusion: Stroke survivors spent more time in active task practice, but a similar amount of time in walking practice when physiotherapy was offered in circuit class therapy sessions versus individual therapy sessions. There is a need for effective strategies to increase the amount of walking practice during physiotherapy sessions for stroke survivors.

Key Practice Points:
• Stroke survivors spend more time in active task practice during circuit class therapy versus individual physiotherapy sessions.
• The amount of walking practice that occurs in either model of physiotherapy service delivery is low.
• Effective strategies for increasing opportunities for walking practice for stroke survivors receiving inpatient rehabilitation are required.

AUSTRALIA HAS STALLED ON IMPROVING RTW: TIME TO GET BACK TO BASICS?

Ellis N

Australia’s performance in RTW has stalled, and no-one knows why. This paper will report on an analysis of behaviour theory relevant to the context of return to work to see if our current approaches match what we know about motivating injured workers to return to work.

SHOULD STUDENTS WORK WEEKENDS?

Elliott S
Medway NHS Foundation Trust

Relevance: Diversification of physiotherapy to provide a seven day service has been required to meet the changing needs of society and to reflect developments and competitive pressures in the health service as this increases productivity and reduces a patient’s length of stay. But there has been little consideration to examine how practically physiotherapists encompass seven day working for student placements.

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Conclusions: Consideration to productivity, cost and quality of care and the students learning experience and the provision of supervision should all be taken into consideration if students are going to work weekends.

Implications: With the advent of seven day working and changing working patterns, there is a need to review student education.

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• Stroke survivors spend more time in active task practice during circuit class therapy versus individual physiotherapy sessions.
• The amount of walking practice that occurs in either model of physiotherapy service delivery is low.
• Effective strategies for increasing opportunities for walking practice for stroke survivors receiving inpatient rehabilitation are required.

A PROSPECTIVE STUDY OF GROIN PAIN AND LOW BACK PAIN IN ATHLETES IN AN AUSTRALIAN FOOTBALL LEAGUE TEAM

Evans K1, Tuttle N1, Williams S2, Isaac E3
1Centre for Musculoskeletal Research, Griffith Health Institute; School of Rehabilitation Sciences, Griffith University, Gold Coast
2Hanaurs program, Griffith University; School of Rehabilitation Sciences, Griffith University, Gold Coast

Question: Does performance on musculoskeletal tests predict groin or low back pain (LBP) in athletes playing in an Australian Football League (AFL) team? Are there differences between officially-reported and self-reported injury data?

design: Prospective study.

Participants: Fifty male elite AFL athletes (mean age 20.9 + 3.2 years)

Intervention: Musculoskeletal tests, athlete characteristics and previous history of groin or low back pain were recorded during the pre-season.

Outcome Measures: In accordance with the AFL’s annual injury surveillance system (AISS) officially-reported injury data was collected weekly throughout the AFL season. Self-reported injury data was obtained through an end of season questionnaire.

Results: Self-reported groin pain was related to strength on the squeeze test at 45° of knee flexion (optimal cut-off point from ROC curve < 168.5 mmHg). Officially-reported LBP was related to hold time for right side bridge endurance test (cut-off <117.5 seconds) and a previous history of LBP. Self-reported LBP was related to right hamstring muscle length (cut-off >162.5° on 90/90 test). There were more athletes with self-reported injuries than officially-reported for both groin pain (13 vs 4) and LBP (26 vs 5).

Conclusion: The squeeze, side bridge endurance and 90/90 tests predicted groin pain or LBP. It is not possible to generalise results to other seasons, teams or sports without validation studies, but it may be worth considering including these tests in screenings. Self-reported injuries were more common than officially reported, in part due to the AISS’s definition of injury, which only accounts for injuries when a match is missed.

Key practice points:
• Specific musculoskeletal tests predicted groin pain and LBP in one AFL team for one season.
• It may be worth including squeeze, side-bridge and 90/90 tests in pre-season screenings.
• Self-reported injuries were higher than officially-reported, in part due to the definition of injury adopted by the AISS.
HEALTH AND COMMUNITY SERVICES IN OLDER ADULTS RECENTLY DISCHARGED FROM HOSPITAL: UTILISATION, COSTS AND IMPACT OF A HOME-EXERCISE INTERVENTION

Faraq I1, Sherrington C1, O’Rourke S1, Ferreira M1, Lord S1, Close J1, Vogler C1, Dean C1, Cumming R1, Howard K2
1The George Institute For Global Health
2Neuroscience Research Australia

Objective: To evaluate usage and costs of hospital, medical, allied health and community services in older adults after hospitalisation and to determine the impact of a home exercise intervention.

Design: Secondary analysis of randomised trial data.

Subjects: 340 people aged 60 years and over within six months of hospital discharge.

Method: Occasions of service use were recorded using monthly calendars. Cost estimates were based on unit costs identified in our recent systematic review (Faraq et al 2013). Resource utilisation and costs were compared between intervention (12 months of home exercise prescribed on 10 visits from a physiotherapist) and control groups.

Results: In the 12-month study period, 33% of participants were re-admitted to hospital, almost 100% consulted a medical practitioner and 62% accessed community services (e.g. showering, shopping). Total costs were $3,574,742 with 58% associated with hospital admission and 30% with community services. The mean (SD) and median (IQR) costs per participant were: $5550 ($15,167) and $0.00 ($2102) for hospital admissions; $222 ($502) and $0 ($564) for allied health services; $1289 ($1189) and $1019 ($3800) for medical/nursing services; and $3467 ($6617) and $1019 ($3744) for community services. There were no significant between-group differences in median costs for hospital (p = 0.45), medical (p = 0.36), allied health (p = 0.52) or community services (p = 0.41).

Conclusion: The study highlights substantial acute care and community costs associated with care for this high risk population. A structured exercise program designed to reduce falls and improve performance did not have a significant impact on resource use.

THE USE OF CLINICAL ANATOMY RESOURCES BY MUSCULOSKELETAL OUTPATIENT PHYSIOTHERAPISTS IN NEW SOUTH WALES PUBLIC HOSPITALS

Farrell SF1,2, Davies TM1 & Cornwall J1
1Department of Physiotherapy, School of Health Sciences, University of Newcastle, Newcastle
2Department of Physiotherapy, Central Coast Local Health District, Gosford

Question: How do public hospital musculoskeletal outpatient physiotherapists interact with and perceive online and textbook clinical anatomy resources in the workplace?

Design: Cross-sectional observational study utilising an 18-question survey.

Participants: One hundred and ninety-three musculoskeletal outpatient physiotherapists from 64 randomly selected New South Wales public hospitals.

Outcome Measures: Questions included information regarding physiotherapist age, sex, qualifications, experience, types of resources utilised, whether resources meet physiotherapists’ requirements, and what improvements could be made to current resources. Data was analysed using descriptive statistics and multinomial logistic regression (p < 0.05).

Results: One hundred and ninety-three physiotherapists responded (75% response rate), of which 52% were aged less than 35 years (62.6% female). 72.7% had only an undergraduate qualification, and 39.3% had practised less than 5 years. 78.4% used resources for current patient management. Less experienced physiotherapists used resources more frequently (Odds Ratios 1.35, 95% CI 1.17 to 1.57), and no significant associations were found between preference for online or written resources and age, sex, qualifications or experience. Trends included less experienced physiotherapists i) identifying absence of internet access as a barrier to resource use, and ii) reporting provision of improved internet facilities as being required to improve access to clinical anatomy resources.

Conclusions: As appropriate clinical decision-making and patient management are based in part on sound anatomical knowledge, results suggest physiotherapists’ access to online anatomy resources could be re-examined in hospital settings where internet access is restricted. This may be of particular necessity in hospital outpatient clinics that employ less experienced physiotherapists. NSW HREC Reference: LNR/12/HNE/210

Key Practice Points:
• Less experienced physiotherapists access clinical anatomy resources in the workplace more frequently than more experienced physiotherapists.
• Absence of internet access was identified by physiotherapists as a potential barrier for seeking clinical anatomy resources.
• Improving workplace internet access may assist less experienced physiotherapists when accessing clinical anatomy resources.

TRANSLATING POLICY INTO PRACTICE TO ENABLE SAFE, EFFECTIVE AND SUSTAINABLE CO-MANAGEMENT OF CONSUMERS WITH RHEUMATOID ARTHRITIS BY COMMUNITY-BASED PHYSIOTHERAPISTS

Fary R1, Slater H1, Chua J2,3, Ranelli S1, Briggs AM1,2,3
1Curtin Health Innovation Research Institute and School of Physiotherapy, Curtin University, Perth
2Department of Health, Government of Western Australia, Perth
3Arthritis and Osteoporosis Victoria, Melbourne

Question: Contemporary health policy promotes participation of the community-based health workforce in the co-management of consumers with chronic health conditions, such as rheumatoid arthritis (RA). Is the physiotherapy workforce ready to participate, and what strategies are needed to facilitate positive practice change?

Design: Iterative policy-into-practice programme: 1) identification of necessary skills and knowledge (Delphi process, guidelines appraisal); 2) determination of learning needs (cross-sectional e-survey); 3) implementation and evaluation of a sustainable learning platform (RCT).

Participants: Australian registered physiotherapists (n=273) and inter-professional implementation team.

Intervention: After phases 1 and 2 were completed, a web-based learning environment was developed and tested.

Outcome Measures: Self-reported confidence in managing consumers with RA and professional development (PD) needs across a range of knowledge and skills related to RA.

Results: Twelve knowledge and 13 skills areas were identified during phase 1. Phase 2 data indicate that gaps in managing consumers with RA include low (22.7–58.2%) and need for PD high (45.1–95.2%). Physiotherapists with greater years of clinical experience, caseload of consumers with RA, postgraduate qualifications in musculoskeletal physiotherapy or, working in musculoskeletal physiotherapy were more confident in managing people with RA and less likely to need PD. On-line and face-to-face formats were preferred modes of PD delivery. The web learning environment was developed and is being tested in a RCT.

Conclusion: Enabling community-based RA service delivery to be effectively established, subgroups within the physiotherapy workforce require upskilling in management of consumers with RA. The web represents a sustainable platform for improving practitioner knowledge and skills.

Key Practice Points:
• Safe and effective management of consumers with RA requires specific knowledge and skills.
• Physiotherapists need upskilling to effectively in managing people with RA in the community.
• Improving practice knowledge and skills requires sustainable and engaging learning modes and the web presents a potentially efficacious strategy.
PREGNANCY-RELATED LUMBOPELVIC PAIN IS ASSOCIATED WITH DISABILITY BUT NOT WITH CHANGES IN GENERAL ACTIVITY LEVELS

Fary R, Chen S, Krenz D, Marklund A, Beales D
School of Physiotherapy, Curtin University, Perth

Question: What is the effect of pregnancy-related lumbopelvic pain on disability and general activity? Is care seeking mediated by pain and disability?

Design: Cross-sectional.

Participants: Women attending an antenatal clinic (n=116).

Methods: Questionnaire.

Outcome Measures: Participants provided details on the presence or absence of pain, pain intensity, and whether or not they had attended for medical care for their pain. From this data subjects were consigned to one of three groups; (i) no pain, (ii) pain but not seeking care and (iii) pain and seeking care. Disability was ascertained from the Pregnancy Mobility Index. General activity levels were ascertained from the Pregnancy Physical Activity Questionnaire.

Results: Disability levels differed between the no pain group and the two pain groups for 2/3 constructs of the Pregnancy Mobility Index (p<0.02; household activities p=0.01, mobility outdoors p=0.45). In contrast there were no differences for the total score of the Pregnancy Physical Activity Questionnaire (p=0.21) or any of its sub-scales. Neither pain intensity nor disability differentiated between care seekers and non-care seekers.

Conclusion: Specific aspects of disability were different in women with/without pregnancy-related lumbopelvic pain. However, this was not the case for general activity, consistent with reports of a complex relationship between physical activity and back pain in general. Neither pain nor disability related to care seeking. This suggests pain and disability may not be primary factors in determining who seeks care for pregnancy-related lumbopelvic pain, or the effect of pain and disability on care seeking is mediated by other factors.

Key Practice Points:
- Physical activity during pregnancy is important for the mother and foetus.
- Disability from pregnancy-related lumbopelvic pain may not mean altered physical activity levels.
- Factors leading to care seeking for pregnancy-related lumbopelvic pain are more complicated than just pain and disability.

PHYSIOTHERAPISTS REQUIRE PROFESSIONAL DEVELOPMENT IN ORDER TO PROVIDE SAFE AND EFFECTIVE CARE TO CONSUMERS WITH RHEUMATOID ARTHRITIS

Fary R1, Slater H2, Chua J1,2, Briggs AM1,3
1Curtin Health Innovation Research Institute and School of Physiotherapy, Curtin University, Perth
2System Policy and Planning, Department of Health (WA), Perth
3Arthritis and Osteoporosis Victoria, Melbourne

Question: Are physiotherapists’ confidence and professional development (PD) needs in service delivery for people with rheumatoid arthritis (RA) related to years of clinical experience, practice experience with people with RA, qualifications in musculoskeletal physiotherapy, and primary area of clinical practice in musculoskeletal physiotherapy?

Design: Cross-sectional.

Participants: Australian-registered physiotherapists (n=273).

Intervention: E-survey collecting; years of clinical experience; current RA clinical caseload; professional qualifications; primary clinical area of practice; confidence and activity and severity and, ability to implement evidence-based treatments (p = 0.04).

Conclusion: Physiotherapists’ PD needs and confidence in providing service delivery for people with RA is related to clinical experience, caseload, area of practice and qualifications.

Key Practice Points:
- Physiotherapists lack confidence in managing people with RA.
- Years of professional experience, caseloads including people with RA, MSKP qualifications, and working in MSKP are related to confidence in managing people with RA and PD needs.
- Professional development should be tailored and targeted to specific subsets of the clinical workforce.

EFFECTS OF EARLY STANDING AND WALKING ON FUNCTION, MOBILITY AND WALK-SPEED AT DISCHARGE, FOR PEOPLE FOLLOWING SURGERY FOR HIP FRACTURE

Ferrier R1, Lamont A1, Kwan S1, Pulle C1, Mendis D1, Low Choy N1
1The Prince Charles Hospital, Queensland, Australia
2Australian Catholic University (McAuley Campus), Banyo, Queensland, Australia

Questions:
- What is the effect of an early standing and walking program on function, general mobility and walk speed at discharge from a multidisciplinary Fractured Neck of Femur (NOF) Service?

Design: Prospective observational study.

Participants: Three hundred people (66% female; mean age 81.4±9.77) following surgery for a fractured NOF.

Intervention: Multidisciplinary care included early standing and walking by physiotherapists.

Outcome Measures: Time to first stand and walk categorised patients (<24hours: 24-48hours; 48-72hours; >72hours).

Function (Modified Barthel Index), mobility (DeMorton Mobility Index) and walking speed (10m walk test, Timed up and Go), length of stay (days), discharge destination, delirium, cognitive state, depression/anxiety, transfusion rates and nutrition were recorded.

Results: Patients who stood and walked within 24hours, had significantly better function (p = 0.001), mobility (p = 0.001) and faster walking speeds (p < 0.001) at discharge. Patients who walked within 48hrs also had significantly better function at discharge than those with delayed walking (p < 0.001). Patients who stood within 24hours were significantly less likely to have delirium (p = 0.008) or a transfusion (p = 0.028) and those who walked within 24hours were also significantly less likely to have delirium (p < 0.001), a transfusion (p = 0.002), cognitive impairment (p = 0.027), shorter length of stay (p < 0.01) and were more likely to be discharged to home (p = 0.001).

Conclusion: Standing and walking within 24hours, contributed to better function, mobility and walk speed at discharge with shorter length of stays and greater likelihood of discharge to home.

Key Practice Points:
- A multidisciplinary service including physiotherapy, yielded positive outcomes for older adults following surgery for fractured NOF.
- Early standing and walking (<24 hours) provided superior outcomes for function, mobility and walking speed at discharge from an orthopaedic ward.
- Delirium, blood transfusions and cognitive impairment delayed standing and walking.
HEALTH-RELATED QUALITY OF LIFE FOLLOWING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: A SYSTEMATIC REVIEW

Filiby S1, Ackerman IN2, Russell T1, Macri E3, Crossley KM4
1Division of Physiotherapy, School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane.
2Melbourne EpICentre, The University of Melbourne, Melbourne.
3Centre for Hip Health and Mobility, University of British Columbia, Vancouver, Canada.

Question: Is health-related quality of life impaired five years or more following anterior cruciate ligament reconstruction? What factors impact health-related quality of life outcomes in this population?

Design: Systematic review with meta-analysis.

Participants: People at a minimum five years following anterior cruciate ligament reconstruction.

Outcome Measures: Any knee specific or generic patient reported outcome which measures health-related quality of life or contains a quality of life component or subscale.

Results: Twenty three devices, 74% of devices tested for step counts, r=0.975, were identified, using between one and five accelerometers, were identified, using between one and five sensors. Observation methods varied, as did activity classification. Devices were typically used to measure ambulant patients greater than 6 months post stroke. Direct observation was commonly used for inpatients. Physical activity was recorded from one hour to ten days. No common outcome existed across all methods/devices. Outcomes included: step counts, activity counts, peak activity, duration and frequency of activity, transitions and postures, time inactive and energy expenditure. Device test-retest reliability ranged from unmentioned in 16 cases to poor (Caltrac for activity calories, r=0.44) to excellent (Step Activity Monitor for step counts, r=0.975). Inter-rater reliability of observation and videotaping methods ranged from 0.51 to 1.00. Validity in stroke was inappropriately reported.

Conclusion: Physical activity measurement is highly variable, particularly in terms of outcomes reported. Devices, while complex, allow for unobtrusive, longer monitoring in free-living environments. In contrast, direct observation/videotaping suits inpatient settings but is time and labour intensive. No single approach appears superior but better definition would improve the field.

Key Practice Points:
• Physical activity measurement is highly variable post stroke and better definition of physical activity outcomes would enhance the field.
• Devices and direct observation are most commonly used, each have pros and cons.
• There is no device ready for clinical application for people with stroke.

OBJECTIVE MEASUREMENT OF PHYSICAL ACTIVITY AFTER STROKE – ARE WE THERE YET?

Fini NA1,2, Simiek J1, Keating J1, Holland AE1,4, Bernhardt J1,3
1Caulfield Hospital, Alfred Health, Melbourne.
2La Trobe University, Melbourne.
3Monash University, Melbourne.
4Alfred Health, Melbourne.

Conclusion: A portion of patients will suffer knee-related impairments in quality of life 5 to 16 years following an anterior cruciate ligament reconstruction. These poor outcomes are more likely in those with meniscal injuries, severe radiographic osteoarthritis, and those having revision surgeries.

Design: Systematic review with meta-analysis.

Participants: People at a minimum five years following anterior cruciate ligament reconstruction.

Outcome Measures: Any knee specific or generic patient reported outcome which measures health-related quality of life or contains a quality of life component or subscale.

Results: Searches yielded 1239 papers, with 93 potentially eligible. Full text review and reference list scanning left 75 papers (46 devices and 29 direct observation or video), including 2441 survivors aged 21 to 96 years. Twenty three devices, 74% accelerometers, were identified, using between one and five sensors. Observation methods varied, as did activity classification. Devices were typically used to measure ambulant patients greater than 6 months post stroke. Direct observation was commonly used for inpatients. Physical activity was recorded from one hour to ten days. No common outcome existed across all methods/devices. Outcomes included: step counts, activity counts, peak activity, duration and frequency of activity, transitions and postures, time inactive and energy expenditure. Device test-retest reliability ranged from unmentioned in 16 cases to poor (Caltrac for activity calories, r=0.44) to excellent (Step Activity Monitor for step counts, r=0.975). Inter-rater reliability of observation and videotaping methods ranged from 0.51 to 1.00. Validity in stroke was inappropriately reported.

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• Physical activity measurement is highly variable post stroke and better definition of physical activity outcomes would enhance the field.
• Devices and direct observation are most commonly used, each have pros and cons.
• There is no device ready for clinical application for people with stroke.

RETHINKING THE KEY WORKER AND TRANSDISCIPLINARY MODEL – WHAT DO FAMILIES REALLY WANT FROM AN EARLY CHILDHOOD INTERVENTION SERVICE?

Foley S
Kids Plus Foundation

Introduction/background:
Recently there has been a change in the way that early intervention service have been provided within Victoria, with the introduction of a key worker model and/or transdisciplinary model. Conceptually early intervention has moved primarily to a mechanism for providing support rather than as a mechanism for providing services. However, there has been limited evaluation of this major change.

Purpose/objectives:
• To identify current practices in delivering the key worker model of service delivery in early childhood intervention services across Victoria.
• To identify the strengths and limitations of the evidence that supports this model, in particular for families and children with complex developmental disabilities.
• To identify other key elements that should be in the current model of service provision.
• To identify the barriers and facilitators to the paediatric physiotherapy profession contributing to policy around best practice in early intervention.

Issues/questions for investigation or ideas for discussion:
• How is the key worker model implemented in your service?
• How is this evaluated from a (1) family/child centred perspective (2) from an organisational perspective?
• As a paediatric physiotherapist what are the advantages/disadvantages?
• Which clients are advantaged/disadvantaged by these models and why?
• What variations/alternatives to these models would support best practice?
• What is the vision for an early childhood intervention service? How can this be evaluated?
• How can the APA Paediatric group facilitate this?
• How will DisabilityCare Australia affect this?
ADVICE FOR SUBACUTE LOW BACK DISORDERS: THE PATIENT’S PERSPECTIVE

Ford JJ1, Slater SL1, Hahne AJ1, Surkitt LD1, Richards MC1, Chan AYP1, Hinman RS1, Davidson M1, Taylor NF1

1Department of Physiotherapy, La Trobe University, Melbourne
2Department of Physiotherapy, Melbourne School of Health Sciences, The University of Melbourne

Advice is recommended in clinical practice guidelines for subacute low back disorders (LBD). The patient’s perspective when receiving advice has not been reported. This study explored patient perspectives of a guideline-based advice program for patients with subacute LBD.

Design: Two x 30 minutes sessions of advice were developed based on the study of Indahl et al (1995) and included a pathological explanation of the participant’s pain, reassurance regarding the generally favourable prognosis of their condition, advice to remain active and instruction regarding correct lifting technique. Participants in a randomised controlled trial who undertook this program underwent a semi-structured interview. Two researchers independently coded interview data using qualitative data-analysis software and thematically analysed the results.

Results: Twenty-one participants were interviewed with some reporting improvements in their condition including reduced pain and increased activity. They associated these changes with improved knowledge (particularly pathoanatomical) and increased confidence with activity based on the reassurance provided. However others stated that the advice was ineffective associated and perceived the treatment as being generic and insufficient in terms of number of sessions/type of treatment provided.

Conclusion: Participants with subacute LBD had varying perspectives in response to guideline-based advice.

Key Practice Points:
- Although recommended in clinical guidelines a significant proportion of people with low back disorders may be non-responsive to advice
- A pathoanatomical explanation is frequently excluded from advice, and should be reconsidered by practitioners and researchers

FEATURES INDICATIVE OF DISCOGENIC LOW BACK PAIN: SURVEY OF AN INTERNATIONAL PHYSIOTHERAPY EXPERT PANEL WITH THE DELPHI TECHNIQUE

Chan AYP1, Ford JJ1, McMeeken JM1, Wilde VE1

1Department of Physiotherapy, La Trobe University, Melbourne
2Department of Physiotherapy, Melbourne School of Health Sciences, The University of Melbourne

The lumbar intervertebral disc is a known source of low back pain however few clinical features indicative of discogenic pain have been validated. This study aimed to obtain consensus from an expert panel on the features indicative of discogenic low back pain.

Design: An international panel of 21 physiotherapists with expertise in LBP participated in a three round Delphi survey. Panelists listed and ranked features that they believed to be indicative of discogenic pain. Indicative features of non-reducible discogenic pain, a potentially relevant subgroup, were also listed and ranked. On completion of round three, features with >50% agreement between panelists were deemed to have reached consensus.

Results: After three rounds, 10 features of discogenic pain were identified with no easing position and symptoms aggravated by sitting being the most prevalent. Nine features of NRDP were identified with no easing position or movement and the absence of centralisation being the most prevalent.

Conclusion: This study provides preliminary validation for the features indicative of discogenic LBP.

Key Practice Points:
- The stated clinical features may be of value in identifying patients with discogenic pain
- Non-reducible discogenic pain may be a subgroup of discogenic pain identifiable by the stated clinical features
- Further validation of the features of discogenic pain identified in this study is recommended

SUBGROUP SPECIFIC PHYSIOTHERAPY VERSUS ADVICE FOR PEOPLE WITH SUBACUTE LOW BACK DISORDERS: A RANDOMISED CONTROLLED TRIAL

Ford JJ1, Hahne AJ1, Surkitt LD1, Richards MC1, Chan AYP1, Slater SL1, Hinman RS1, Davidson M1, Taylor NF1

1Department of Physiotherapy, La Trobe University, Melbourne
2Department of Physiotherapy, Melbourne School of Health Sciences, The University of Melbourne

Question: For people with subacute low back disorders, is specific physiotherapy treatment targeting pathoanatomical, neuropathological and psychosocial factors more effective than guideline-recommended advice?

Design: Multicenter, parallel group randomised controlled trial.

Participants: 300 people with low back and/or referred leg pain of between 6 weeks to 6 months duration. Only participants that could be classified into one of 5 subgroups were included.

Interventions: Participants were randomly allocated to receive either 10 sessions of subgroup specific physiotherapy or two sessions of guideline-recommended advice over a 10-week period.

Outcome Measures: Primary outcomes were activity limitation (Oswestry Disability Index), and separate 0-10 numerical pain rating scales for leg pain and back pain. Measures were taken at baseline and at 5, 10, 26 and 52 week time points.

Results: Linear mixed model analysis showed that between group differences for activity limitation (Oswestry) favoured specific physiotherapy 10-weeks (4.7; 95% CI 2.0 to 7.5), 26-weeks (5.4; 95% CI 2.6 to 8.2) and 52-weeks (4.3; 95% CI 1.4 to 7.1). Similarly back and leg pain were significantly lower in the physiotherapy group relative to the advice group at 10-weeks (Back:1.3; 95% CI 0.8 to 1.8, Leg:1.1; 95% CI 0.5 to 1.7) and 26-weeks (Back: 0.9; 95% CI 0.4 to 1.4, Leg:1.0; 95% CI 0.4 to 1.6) time points.

Conclusion: In people with subacute LBD and classified into one of 5 subgroups, specific physiotherapy led to greater reduction in back and leg pain, relative to guideline-recommended advice.

Key Practice Points:
- For people with subacute LBD, specific physiotherapy appears more effective than guideline-recommended advice
- The differences are clinically important
- Classification and the specific treatment of LBD may lead to improved clinical outcomes

OLDER PEOPLE’S PERSPECTIVES ON PARTICIPATION IN EXERCISE: A SYSTEMATIC REVIEW AND THEMATIC SYNTHESIS OF QUALITATIVE LITERATURE

Franco MRC1, Tong A1, Howard K1, Sherrington C1, Ferreira P1, Ferreira M1

1The George Institute for Global Health, The University of Sydney, Sydney
2Sydney School of Public Health, The University of Sydney, Sydney
3Faculty of Health Science, The University of Sydney, Sydney

Question: What are the experiences and perceptions of older people on barriers and facilitators to the uptake and adherence to exercise?

Design: Systematic review and thematic synthesis of qualitative literature.

Participants: Older people aged 60 years or over.

Intervention: Any type of physical exercise, with a focus on exercise programs designed to prevent falls. Studies investigating exercise in a population with a specific health condition (e.g. coronary heart disease, diabetes) were excluded.

Outcome Measures: Experiences and perceptions of older people on barriers and facilitators to the uptake and adherence to these exercise programs.
Results: Thirty-four studies involving 2091 participants were included. Six major themes central to older people’s perspectives on exercise were identified: social influences (valuing interaction with peers, social awkwardness, encouragement from others, dependence on professional instruction), physical limitations (pain or discomfort, concerns about falling, comorbidities), competing priorities, access difficulties (environmental barriers, inability to afford), personal benefits of exercise (strength, balance and flexibility, self-confidence, independence, improved health and mental well-being), and motivation and beliefs (apathy, perceived inevitability of age-related deterioration).

Conclusion: Barriers to older people’s participation in exercise programs involve physical limitations, access difficulties and motivation and beliefs. Interventions that enhance older people’s confidence to exercise, improve access to exercise facilities, and inform older people about the benefits of exercise may increase the uptake and adherence to exercise among the older population.

Key Practice Points:
• Health professionals should address modifiable individual factors that may function as barriers to exercise (e.g., concerns about falling, low motivation).
• Participants should be better informed of the benefits of exercise including the preventability of falls.
• Policy makers need to consider modification of environmental barriers, such as poor access to transport.

AN INVESTIGATION OF THE BARRIERS TO IMPLEMENT CONTINENCE SCREENING AND PELVIC FLOOR MUSCLE TRAINING GUIDELINES IN PRIMARY MATERNITY CARE
Frawley HC, Chiarelli P
1 The University of Melbourne, Melbourne
2 University of Newcastle, Newcastle

Questions: Can international guidelines to prevent and treat urinary incontinence in pregnant and postnatal women be implemented in a primary maternity care setting?

Design: A prospective observational study utilising translational research methods.

Participants: Midwives and obstetricians in antenatal clinics in a metropolitan health network.

Outcome Measures: A barriers analysis to implementation of continence screening and pelvic floor muscle training, including brainstorming, interviews and feedback with key stake-holders.

Results: Barriers to implementation and uptake of the proposed intervention were predominantly at the organisation and clinician levels. Most clinicians were in support of the intervention, however few were aware of the specific recommendations to meet ‘best practice’ standard. Although agreement to implement the guidelines was strong ‘in principle’, this reduced significantly when practical implementation was considered. Specific barriers included: (1) perception that the guidelines were ambiguous and too detailed; (2) concern that education supervision would become too onerous; (3) concern that students would become too dependent; (4) concern that the guidelines would take up too much time.

Conclusion: The pathway of implementation of this clinical guideline from ‘aware, agree, adopt, adhere’ demonstrated attrition in this context. Specific skill-training in continence management, pelvic floor muscle clinical assessment and exercise instruction emerged as knowledge-based and professional-cultural barriers, and ‘time’ to deliver this intervention as a work-place barrier. Adaptation of the guidelines to suit local context was achieved in collaboration with midwives. Adoption of the modified guidelines occurred in two autonomous midwifery-led birth centres. Adherence was high, with all staff in both units participating in the training and implementation phases.

A clinical supervision training program for physiotherapists using peer reflection focus groups.

Frith CA1, Delany CM2, Brock KA1
1 St Vincent’s Hospital Melbourne
2 Melbourne University

Question: How does a series of three peer reflection focus groups alter participating physiotherapy supervisors’ confidence in their clinical supervision skills?

Design: Action research methods

Participants: Nine Grade 2 physiotherapy student supervisors in an acute hospital setting.

Intervention: Participants attended three one hour reflective focus groups and completed a diary on their teaching experiences over a three month period. Participants identified challenging areas in student supervision and three key educational concepts were discussed: self-directed learning, active learning and fostering independent critical thinking. Participants trialed three teaching strategies based on these concepts; providing more positive feedback, asking students more questions and enabling students to assess their own performance. The supervisors recorded their perceptions of the impact of their teaching strategy.

Outcome Measures: Pre and post measures of supervisor confidence were recorded using the Barwon Health clinical education supervision self-efficacy tool. Diary recordings and reflective discussion transcripts were collected.
Results: Mean supervision experience of participants was 3.5 years. Five of the nine attended all three focus groups. Based on pre-focus group responses to the self efficacy survey, 80% of participants indicated medium to low confidence and felt they needed "feedback or support" – in one or more clinical supervision category surveyed. Post-focus group all participants reported feeling more confident in these categories. Group transcripts and diaries showed six participants spent more time listening and gained greater insights into students’ comprehension levels.

Conclusion: The results indicate that a series of peer group reflection focus groups can alter clinical educators’ confidence and supervision skills.

Key Practice Points:
- Application of learning theory concepts to student clinical supervision can be challenging for supervisors.
- Action research involving group discussions and active reflection on teaching practice can increase supervisor confidence.
- Action research where supervisors trial and refine their teaching strategies can significantly improve student learning experiences.

Ethics approval given by St Vincent’s Hospital Human Research Ethics Committee granted for 4 years

PATIENTS EXPECTATIONS AND EXPERIENCES OF REHABILITATION AFTER LUNG TRANSPLANTATION: A QUALITATIVE STUDY

Fuller LM1, Button B1, Tarrant B1, Battistuzzo CR2, Snell G1, Holland AE1
1Physiotherapy Dept, The Alfred, Melbourne
2La Trobe University, Bundoora
3ARMED, The Alfred, Melbourne
4Monash University, Clayton
5University of Melbourne, Melbourne

Exercise rehabilitation is commonly undertaken before and after lung transplantation, but little is known about the patient experience of this treatment. This qualitative study explored patients’ expectations and attitudes to a supervised exercise rehabilitation program following lung transplantation.

Methods: Participants undertook two semi-structured interviews, one before commencement of rehabilitation and one at the conclusion of the rehabilitation program. Interviews were digitally recorded and line by line iterative thematic analysis of the transcribed interviews was completed. Open coding followed by axial coding was used to develop major themes and sub-themes based on grounded theory. Quotations were extracted from the transcripts to support the data for each theme.

Results: 18 adults (11 females) took part with mean age of 52. The themes developed were: (1) hopes of returning to normal life, including resuming family roles, performing everyday activities and return to leisure or sporting activities; (2) the importance of rehabilitation as the mechanism for how this transformation occurred; (3) the benefits of exercising in a group setting; and (4) the limitations on rehabilitation that were imposed by co-morbidities, either existing pre transplant or occurring as a post operative sequelae.

Conclusion: Post transplant exercise rehabilitation was perceived as a highly valuable tool that assisted recipients to attain their goal of returning to normal life. Group exercise was motivational, offered peer support and therefore was advantageous to assist patients to achieve their desired physical performance level following transplantation.

Key practice points:
- Identify the importance of exercise rehabilitation to the patients.
- Identify the patients expectations of rehabilitation.
- Develop exercise programs that meet both patients goals and maximise cardiovascular and muscle benefits of the lung transplant.

RISK FACTORS FOR ACUTE AND CHRONIC INJURY IN RECREATIONAL AND COMPETITIVE SURFERS

Furness J1, Hing W1, Walsh J1, Sheppard J1, Clistim St1
1Bond University
2Fitness Clinic
3Hurley Surfing Australia High Performance Centre

Questions: Are there age related differences in the incidence of acute injuries or the prevalence of chronic injuries for recreational and competitive surfers.

Design: Retrospective observational study.

Participants: A total of 1,348 participants completed an online survey consisting of three sections: demographics, acute and chronic injury.

Results: Of 1,348 surfers (1,231 male, mean age 36.2 ±13.2, 117 female mean age 31.9 ±11.1), 708 (52.5%) suffered an acute injury whilst surfing in the preceding 12 months. As expected those suffering an acute injury on average spent significantly (t=5.2, p<0.001) more time surfing (343.1 ±12.0 versus 263.1 ±259.9 hours/year) than those who were uninjured. Independent t tests revealed a significant difference (t=5.2, p<0.001) between age and incidence of acute injury with younger surfers (34.1 ±12.3 versus 37.8 ±13.6 years) more likely to sustain an acute injury in the previous twelve months. Of the 1,348 surfers, 477 (35.4%) suffered from a chronic injury caused or aggravated by surfing. Older surfers (39.3 ±12.0 vs. 33.9 ±13.3 years) were more likely to sustain a chronic injury (t=7.6, p<0.001) whilst surfing. Of interest there was no significant difference (t=0.38, p=0.11) between prevalence of chronic injury and hours spent surfing (309.6 ±272.0 versus 303.2 ±301.3 hours/year).

Conclusion: This information aids in identifying surfers who are more at risk of acute and chronic injury. These findings reinforce the relevance of preventative surf specific conditioning (proprioceptive, strength and flexibility) exercises in at risk surfing sub-groups.

Key Practice Points:
- Younger surfers were more at risk of suffering an acute injury (<35 years), Older surfers were more likely to suffer a chronic injury (>38 years).
- Acute injury was associated with increased hours surfing (>6.5 hours per week).
- Screening and surf specific conditioning exercises could be implemented for at risk sub-groups.

INCREASED ACUTE LOWER LIMB INJURIES ARE ASSOCIATED WITH COMPLETING AERIAL MANOEUVRES IN SURFING

Furness J1, Hing W1, Walsh J1, Sheppard J1, Clistim St1
1Bond Institute of Health & Sport, Faculty of Health Sciences, Bond University, Gold Coast
2Fitness Clinic, Five Dock, Sydney
3Hurley Surfing Australia High Performance Centre, Kingscliff

Question: Is there a higher incidence of acute lower limb injuries in surfers who complete aerial manoeuvres.

Design: Retrospective observational study of recreational and competitive surfers.

Participants: 1,348 participants completed an online survey consisting of three sections: demographics, acute and chronic injury.

Results: Surfers completing aerial manoeuvres reported a significantly (B=10.3, p<0.01) higher incidence of acute injury (62.4% versus 50.9%). Conversely there was a significantly (B=4.9, p<0.05) greater association between chronic injury and surfers who did not complete aerial manoeuvres (28.9% versus 36.5%). This was expected given those carrying chronic injury would perhaps be disinclined to complete such challenging manoeuvres. Younger surfers were more likely to complete aerial manoeuvres with a significant difference (t=15.5, p<0.001) in the age of surfers (mean ages 25.7 ±9.2 years versus 37.5±12.9 years). Of the 194 participants who completed aerial manoeuvres, 44.3% suffered from an acute lower body injury which was significantly higher (B=27.3, p<0.001) than for those that did not regularly perform aerials (27.6%). Conversely there were an increased percentage of upper body acute injuries in those that did not perform aerials over those that did (32.1% vs. 29.4%). Though this difference was non-significant (B<0.7), it indicated that this association between aerial manoeuvres and acute injury was only associated with the lower body.
Conclusion: These results suggest that surfers who complete aerial manoeuvres on a regular basis should be performing conditioning (strength, proprioceptive and flexibility) exercises to assist in the prevention of lower body injuries.

Key Practice Points:
- Aerial manoeuvres are associated with a significantly higher incidence of acute lower body injuries in surfers
- Younger surfers were more likely to perform aerials manoeuvres.
- It is recommended that surfers completing aerial manoeuvres should be engaging in surf specific conditioning (proprioceptive, strength and flexibility) exercises.

THE INFLUENCE OF ‘SLACKLINING’ ON QUADRICEPS REHABILITATION, ACTIVATION AND INTENSITY

Gabel CP1, Burkett B1, Melloh M2, Osborne J3

1University of the Sunshine Coast, Queensland
2University of Western Australia
3Louisville University USA

Questions: Can the level of quadriceps activation for participants with a knee injury during open-chain, closed-chain and composite kinetic-chain (slackline) clinical based exercises be determined and compared?

Design: Repeated measures (within-subjects) ANOVA.

Participants: Consecutive physiotherapy outpatients (n=49, 41.8 +/- 16.8 years, range 13-72 years, 57% female) with an acute (<2 weeks) knee injury.

Outcome Measures: Median score on electromyography as measured in microvolts (μV) from three recorded tests of quadriceps activation using skin mounted electromyography during five separate clinical quadriceps activation exercises: two open-chain, inner range quads and straight leg raise; two closed-chain, step down and step up; and a composite-chain, slacklining step-up. Perceived exertion as measured on an 11-point numerical rating scale, this was recorded during the performance of each exercise.

Results: Median scores of the open- and closed-chain exercises showed no statistical difference, while the composite-chain quadriceps slackline exercise showed significantly (p<0.0001) higher levels of quadriceps activation (F (2.52, 121.00) =21.53, p<0.0001) at significantly lower levels of exertion (F (1.62, 77.70) =26.88, p<0.0001).

Conclusion: The use of slackline rehabilitation training can provide significant increases in activation and recruitment of the quadriceps irrespective of pain or functional inhibition. This activation occurs spontaneously at significantly lower levels of perceived exertion. This spontaneous quadriceps activation in a selective and simple manner is a valuable adjunct exercise for lower limb rehabilitation programs. This is of particular relevance for the outpatient setting and circumstances where the quadriceps is inhibited and activation is required.

Key Practice Points:
- Slacklining is a composite-chain exercise that innately recruits the quadriceps irrespective of pain or functional inhibition.
- Slacklining rehabilitation was more effective than open- or closed-chain exercises for quadriceps recruitment at lower perceived exertion.
- Slackline rehabilitation provided significant increases in quadriceps activation and recruitment in the clinical setting.

PATIENT-REPORTED DECISION SUPPORT SOFTWARE FOR MONITORING GLOBAL STATUS AND FUNCTIONAL RECOVERY IN A STROKE PATIENT FROM INPATIENT TO HOME

Gabel CP1

1Coolum Physiotherapy

Questions: Can patient-reported decision support software provide longitudinal monitoring of global status and functional recovery of a stroke patient during the phases of hospital, transition care and home settings.

Design: Case study.

Participants: An 87 year old female stroke patient with lower limb functional loss and hemi-paraesthesia.

Outcome Measures: Advise Rehab decision support software.

Results: The functional monitoring provided an at-a-glance summary and indication of the patient’s global and functional status and progress. This global view supplemented stroke specific monitoring but was easier to read and convey an overall history of status and progress plus anticipated rates of improvement. The patient suffered a minor stroke with significant loss of functional control of the right lower limb below the knee, some reduction in cognitive function and spatial awareness, minor paraesthesia to the whole right side and reduced balance. The consequence was marked loss of independence requiring hospitalisation for rehabilitation and general recovery through inpatient medical, physiotherapy and occupational therapy care. This was for 11 weeks duration prior to transfer to a transitional care facility for 3 weeks where status regressed, prior to discharge and return to home with a community support program of nursing, OT physiotherapy and a personal carer.

Conclusion: This is a first reported use of such decision support software in a neurological patient. It offers a quick, easy to use, accurate self-reported outcome measure that provided a longitudinal progressive and forecasted history for status and progress with both feedback and a summary visual history appropriate for all stakeholders.

Key Practice Points:
- Self-report decision support software provided at-a-glance global functional status and progress for a neurological patient.
- The system was easy to use and accurate with a progressive and forecasted visual history.
- The system was appropriate for all stakeholders.
The Calendar Test: A Simple Clinical Test to Facilitate Assessment and Management of Deficient Cervical Proprioception Post Whiplash Associated Disorder

Gabel CP

University of the Sunshine Coast, Queensland


Design: Pilot investigation through case series test and retest for inter and intra operator reliability and progression through minimal detectable change.

Participants: Consecutive WAD-2 patients, n=10, female=7, average age=37±5.

Outcome Measures: Eye focus position using a grid system – monthly calendar.

Results: Inter and Intra operator reliability indicated a high level of reliability (Pearson’s r=0.92) and a minimal detectable change of 1 date square for the test in this pilot case series.

Conclusion: Use of a simple monthly calendar provided a readily available clinical tool with a fixed grid system to enable testing and training for deficient cervical proprioception following WAD. The test can be applied in minutes as a home exercise. Progression is self-managed and self-motivated as the patient is able to recognise both the deficiency and change immediately. Comparison of the unaffected side and unaffected movements provides immediate feedback to the patient and therapist on the accuracy and repeatability of the test. The significance of the minimal detectable change of one ‘date square’ is adequate to encourage and indicate patient progression and exercise compliance. Further research and clinical study are required to build upon this pilot investigation.

Key Practice Points:
- The ‘Calendar Test’ provides a quick and simple clinical test for cervical proprioception deficiency post-WAD.
- The test appears sensitive to change and reliable within (intra-operator) and between (inter-operator) therapists in this pilot investigation.
- The test is self-managed and self-motivating as patients recognise both the deficiency and change immediately.

Outcomes and Prediction Questionnaires: What Are the Optimal Musculoskeletal Tools for Clinical Use? How Do We Know What Is Appropriate?

Gabel P

Coolum Physiotherapy

Introduction/background:
Patient reported outcome (PRO) measures and screening questionnaires are an integral part of clinical and research physiotherapy. They provide the real-time quantification of a patient’s status, their areas of potential risk for delayed recovery, their current progression and their expected recovery pathway. However, the general understanding of these tools, their selection for clinical use and what makes a tool suitable, valid and reliable is an area of contention or confusion. The criteria that determine what tool should be selected and what makes it appropriate and effective is generally poorly understood and rarely considered in depth by physiotherapists. Many physiotherapists are influenced by what is promoted or recommended without understanding the fundamentals of what properties and characteristics are required.

Purpose/objectives: To present the question of what is needed by clinician and researchers to provide meaningful outcome data – then what criteria fulfill this need from the perspective of clinimetrics, the relevant tools properties and the psychometric and practical characteristics that are essential in order to meet these needs within a clinically efficient and effective setting.

Issues/questions for investigation or ideas for discussion: What are the fundamental criteria that make tools relevant, valid and reliable? How do we select these tools? How do we utilise them in the clinical and research settings?

Advancing Physiotherapy – Where Are We Now and Where to From Here?

Harding P

In recent years there has been significant change in the delivery of physiotherapy services within the public hospital sector. A patient’s first point of contact upon entering the public hospital system has traditionally been via a consultation with a medical practitioner or specialist. With the introduction of advanced physiotherapy services this has now changed, and the patient’s first point of contact upon presenting to the public hospital sector can now be via an experienced physiotherapist. The increasing burden placed on medical teams combined with the recent success of initiatives using a physiotherapist in roles traditionally done by doctors, has led to a rapid development of advanced physiotherapy services throughout the public hospital sector. These roles have been the title of advanced physiotherapy practice and these practices because the skills and knowledge required extends beyond the traditional training of a physiotherapist. It includes but is not limited to: advanced knowledge and skills in the use and interpretation of investigations – imaging and pathology, pharmacological, fracture and wound management, differential diagnosis, fast tracking of patients for surgical interventions and conducting post-operative reviews traditionally done by surgeons. Both in the Emergency and Outpatient Departments some patients presenting with presentations such as non-critical musculoskeletal conditions are now being managed entirely by a physiotherapist.

Nationally, Health Workforce Australia are currently conducting a project titled Expanding Scope of Practice for Physiotherapists in Emergency Departments that involves 10 hospitals across Australia implementing and evaluating the primary contact musculoskeletal physiotherapy service in the ED. Locally in Victoria, the Department of Health have provided funding for development of resources and toolkits to support the implementation of advanced musculoskeletal physiotherapy services across Victoria and will be supporting the state-wide rollout of additional advanced musculoskeletal physiotherapy services in 2013-14.

Details of these projects will be discussed.

Using Acupuncture Derived Dry Needling to Facilitate Actively Regaining Range of Movement in Chronic Neck Patients

Gabel CP

University of the Sunshine Coast, Queensland

Questions: Can acupuncture derived dry needling (DN) facilitate the active regaining of cervical range of movement in chronic neck patients?

Design: Pilot investigation using repeated n=1 case series.

Participants: Consistent physiotherapy outpatients (n=10) with chronic symptomatic neck dysfunction (>12 weeks duration) and loss of cervical rotation and/or lateral flexion of more than 25%.

Outcome Measures: Active range of movement with goniometry and patient report changes in activities of daily living (ADL) and measured with the short form 10-item spine functional index (SFI-10).

Results: All patients treated with repeated DN to their reported sites of range inhibition due to pain or tightness, ‘following-the-pain’, with a concurrent proprioceptive-neuromuscular-facilitation (PNF) hold-relax technique, had immediate and sustained improvements in range >15 degrees in rotation and 10 degrees in lateral flexion as measured by goniometry. The treatment application averaged three sites per patient and two repeated hold-relax then active movements per application point. The immediate gains were sustained within the session and carried forward to ADL, function and between sessions.

Conclusion: Acupuncture derived DN can be used as an adjunct to recognised therapist PNF techniques for facilitating the active improvement in deficit cervical range of movement. This is a simple, effective, quick and low risk technique that offers immediate feedback on potential effectiveness. Gains in range are sustained within the session and carried forward to ADL, function and between sessions.

Key Practice Points:
- DN can be used as an adjunct to recognised therapist PNF techniques for facilitating active improvement in cervical range.
- Repeated DN with the ‘following-the-pain’ technique is simple, low-risk and offers immediate feedback on potential effectiveness.
- Gains in range are sustained within the session and carried forward to ADL and between sessions.
in further detail in the presentation. Similar initiatives have also taken place in Queensland and ACT.

It is a time of increasing demands and pressures on the Australian healthcare system and continuing with the traditional ‘status quo’ approach to healthcare is not a sustainable option. This provides a significant opportunity for further expansion of advanced physiotherapy roles and a chance to impact national and state health care reforms of service delivery, workforce planning and retention for the future.

**ECONOMIC IMPACT OF ERGONOMIC INTERVENTIONS**

Hedge A

Ergonomics strives to create workplaces that are comfortable, that promote health and well-being, and that facilitate work performance, by designing the interactions between the capabilities of the people, the design of their tools and the tasks they perform, the techniques that they had been trained to adopt, and the environmental conditions in which they work. However, ergonomics is often a misunderstood discipline and questions about ergonomic considerations are only raised after workers have been injured. Post-injury treatment is usually provided by healthcare specialists who, while talented in their profession, often formal lack training in workplace ergonomics, and who are unable to improve the design of the workplace conditions that resulted in the occurrence of the injury in the first place. Consequently, poorly designed workplaces frequently result in repeated injuries. Moreover, many products are advertised as being “ergonomic”, and purchased by companies without any understanding of whether or not they are appropriate for the risks that caused injury. Inappropriate products do not work and this results in erroneous beliefs that ergonomics is ineffective. All companies focus on their financial performance, and one way to attract attention to ergonomics is to demonstrate the economic benefits of ergonomic interventions. Evidence that has applied economic analyses to evaluate the impact of ergonomic interventions will be reviewed. The return on investment from an appropriate ergonomics intervention has been shown to be as high as a 17:1! Ergonomics is a highly cost-effective way of improving the well-being of workers and the performance of their employers.

**EXERCISE IN CARDIAC CONDITIONS: PHASE I CARDIAC REHABILITATION**

Hirschhorn A

Westmead Private Physiotherapy Services, The Clinical Research Institute

Exercise capacity is significantly reduced in the early postoperative period after cardiac surgery. But why? And what can physiotherapists do about it? In this presentation, Andrew Hirschhorn will discuss: i) the physiological mechanisms responsible for the reduction in exercise capacity after cardiac surgery; ii) the role of physiotherapy-supervised exercise in Phase I cardiac rehabilitation; iii) the role of other factors involved in exercise capacity; and iv) how to prescribe and monitor exercise after cardiac surgery. It’s not just walking, DB and CI.

**NEW PERSPECTIVES FOR FUNCTIONAL HAND USE IN CHILDREN WITH HEMIPLEGIA**

Hoare B, Greaves S

Manual ability is a complex interplay between the task, individual and environment. It is not simply the way by which we move our arms and hands. Manual ability is the capacity to perform daily activities requiring the use of the upper limbs, whatever the strategy, which can be observed from activity performance in the person’s everyday context (WHO, 2001).

In order to understand manual ability we need to consider factors other than those limited to the person. Reflecting on a historical perspective and using case examples, this session will focus on the significant developments in knowledge relating to factors that impact on a child’s ability to use their upper limbs. It will explore the influence of the International Classification of Functioning, Disability and Health, the Manual Ability Classification System and assessments such as the Assisting Hand Assessment (AHA) and Mini-AHA on this knowledge development. With a particular focus on upper limb bimanual performance, the session will provide understanding on what is the role of an effective assisting hand and what constitutes functional hand use for children with unilateral disability.

**Learning Objectives:**

At the end of this session, participants will have learned about:

- Historical perspectives of hand function
- Manual ability and the interaction between the activity, the individual and the environment.
- Development of bimanual performance in children with unilateral upper limb impairment, including the role of the assisting hand
- Neural plasticity in unilateral cerebral palsy and implications for interventions.

**Key Readings/Reference List:**


**BACK INJURIES IN ROWING: NEW MOVES FOR PREVENTION**

Hooper I

Rowing Australia has been operating an injury and illness surveillance system since 2006. For approximately three months every year athletes in the National Team are closely monitored. During this phase there is a high degree of confidence that all injury and illness episodes are being captured. Improved statistics over the last 5 years has allowed for a much clearer picture of the nature of the problems. Amongst these elite rowers chest wall pain is a significant issue. Roughly 50% of injuries to the chest wall will be bony in nature, with rib stress reaction being common. The collection of statistics has lead to the development of guidelines for management of chest wall pain in rowing, including being much more aggressive with removal from on water training. This has had a positive impact on the time lost due to chest wall pain.

Another significant issue in elite rowing is lumbar spine pain. The statistics reveal interesting trends. In 2011 and 2012 women lost no time to lumbar spine injuries. There was a proportional difference of men vs women in the team, with women only representing 39% of the team. There could be several reasons for this difference but there is suspicion that increased flexibility allows women to adopt better postures during the rowing stroke. With any sport involving the repetition of the same cyclical movement pattern, small technical errors can contribute to significant problems. Rib stress reactions and lumbar disc injuries are great examples of this.

During the APA Conference 2013 we will explore common technical errors and movement pattern faults during rowing. Then we will examine some ways that physiotherapists can be involved in the retraining of these faults. National Team physiotherapist JP Caneiro has been doing some great work with fellow researchers Leo Ng and Professor Peter O’Sullivan looking at movement patterns, particularly lumbar postures and how they relate to injury. Simple interventions in postural awareness have had significant differences in injury rates with school age rowers. Meanwhile Olympic Team Physiotherapist Kellie Wilkie has been looking more at the endurance of the key muscles around the trunk and pelvis in elite rowers. Observations that elite medal winning rowers that have very high levels of trunk strength can still be poor in endurance and postural awareness have lead to the development of specific strategies. Both JP and Kellie have significantly contributed to our management and preventative strategies for lumbar spine pain in rowers. These observations and strategies will be shared with the audience at the conference.
Providing timely home based rehabilitation to improve functional independence and ability to manage at home following hospital discharge


Question: Does early access to home based rehabilitation improve functional independence and support clients to manage at home following hospital discharge? Design: Evaluation of the Rehab in the Home service. Participants: 113 clients consented to partake in the evaluation. The average age of participants was 73.5, and the main reason for referral being falls or back pain. 12% of participants were excluded from the evaluation due to readmission within the intervention period.

Intervention: Home based physiotherapy and/or occupational therapy post discharge from the emergency department, short stay unit or sub-acute geriatric unit.

Outcome Measures: Timed Up and Go (TUG) pre and post intervention. Retrospective phone interview at one and twelve months to identify: number of falls post intervention; compliance with therapist recommendations; ability to manage at home; and satisfaction with the service.

Results: Mean improvement in TUG of 11 seconds. At one month follow up 10% of participants reported further fall(s) which increased to 28% at 12 months. 73% of clients reported compliance with therapist recommendations at one month and 76% compliance at 12 months. 87% of participants reported they were able to manage at home at one month, increasing to 89% at 12 months. The program was rated beneficial by 95% of participants at one month, decreasing to 78% at twelve months.

Conclusion: The RITH program appears to be effective at improving clients' functional independence. Participants reported a high level of compliance with therapist recommendations, satisfaction with the program and ability to manage at home following RITH intervention.

Key Practice Points:
- Early access to physiotherapy and/or occupational therapy intervention post discharge appears to be effective at improving clients’ functional independence.
- Clients found that early access to home based rehabilitation is beneficial following discharge from hospital.

Idiopathic normal pressure hydrocephalus, is there a role for physiotherapists in management?

Gallagher R1, Osmotherly P1, Chiarelli P2
1 Hunter New England Local Health District
2 The University of Newcastle

Question: Idiopathic normal pressure hydrocephalus, is there a role for physiotherapists in its management? Design: Literature review of published papers between 1990 and 2013 on idiopathic normal pressure hydrocephalus.

Participants: Patients with gait disturbance and idiopathic normal pressure hydrocephalus undergoing investigation for insertion of a ventricular peritoneal shunt by cerebrospinal fluid drainage.

Intervention: Drainage of cerebrospinal fluid via lumbar puncture of external lumbar drainage to identify improvements in gait or cognition. Assessment of gait disturbance before and after cerebrospinal fluid drainage for identification of change.

Outcome Measures: Gait abnormality in idiopathic normal pressure hydrocephalus and outcome measures demonstrated to identify and quantify change in response to cerebrospinal fluid drainage.

Results: the search yielded 28 papers highlighting gait abnormalities of reasonable or good quality. Papers consisted of research in gait abnormality in idiopathic normal pressure hydrocephalus and identification of response to cerebrospinal fluid drainage. Gait abnormalities in idiopathic normal pressure hydrocephalus have been well documented. Improvements in gait abnormality too have been well documented post cerebrospinal fluid drainage. Quantitative measure of improvement in changes are lacking, but evidence exists supporting the use of outcome measures such as the timed up and go, 10m walk test and Tinetti assessment.

Conclusion: Improvement in gait disturbance after drainage of cerebrospinal fluid has been identified as a positive predictor of outcome post shunt insertion. Physiotherapists are uniquely positioned to assess and identify change in gait before and after CSF drainage, and would benefit from involvement in management of patients with idiopathic normal pressure hydrocephalus.

Key Practice Points:
- Idiopathic normal pressure hydrocephalus represents a potentially reversible form of gait disturbance through the insertion of a ventricular peritoneal shunt.
- Improvement in gait after Cerebrospinal fluid drainage has been identified as a positive predictor of outcome post shunt insertion.
- Physiotherapy outcome measures such as the timed up and go and Tinetti assessments have shown to accurately identify response to cerebrospinal fluid drainage and should be considered for use in evaluation response to cerebrospinal fluid drainage.

Effective Treatment for a Droopy Scapula

Pizzari T1, Wickham JB1, Balster, S1, Ganderton CL1, Watson L1,2
1 Department of Physiotherapy, La Trobe University, Bundoora
2 LifeCare Prahran Sports Medicine Centre, Prahran

Question: Does modifying a shrug exercise facilitate the upward rotator muscles of the scapula? Design: Cross sectional, within-participant experimental study. Participants: Twenty-three control participants and 14 participants with multidirectional shoulder instability.

Intervention: Surface electrodes recorded electromyographic activity from the upper trapezius, middle trapezius, lower trapezius and serratus anterior muscles. Participants completed 10 trials of a standard shrug exercise at 0° of shoulder abduction and an upward rotation shrug exercise at 30° of shoulder abduction in the coronal plane.

Outcome Measures: Muscle activity was expressed as a percentage of maximum voluntary isometric contraction.

Results: The four muscles tested performed at a high intensity during the modified shrug than the standard shrug. Upper trapezius and lower trapezius activity was significantly greater (p<0.05) in both populations. Though, for middle trapezius and serratus anterior muscles, the modified shrug was statistical significant only in the normal population, p = 0.031 and p = <0.001 respectively.

Conclusion: The upward rotation shrug is a more effective exercise for strengthening the upper and lower trapezius than the standard shrug in a normal and multi-directional instability population. Clinically, the upward rotation shrug can be used to address scapula dyskinesia involving drooping shoulders and reduced scapula upward rotation.

Key Practice Points:
- Modifying a shrug exercise by abducting the arm to 30° increases activity of the upward rotators of the scapula.
- Improving scapular position and upward rotation motion may correct dyskinesia and dysfunction of the shoulder.
- The upward rotation shrug is a simple modification that can be used for a number of shoulder conditions.

A Novel Way to Train Subscapularis

Ganderton CL1, Pizzari T1, Watson L1,2
1 Department of Physiotherapy, La Trobe University, Bundoora
2 LifeCare Prahran Sports Medicine Centre, Prahran

Question: Does modifying standard rotator cuff exercises increase the activation of a normal internal rotator? Design: Cross sectional, within-participant experimental study. Participants: Ten subjects with a mean age of 22.8 years (±3.1) and no past history of shoulder pain, injury or surgery were recruited from a University population.
Intervention: Intramuscular electrodes recorded electromyographic activity of three rotator cuff muscles from ten dominant healthy shoulders. Participants performed eight continuous repetitions each of standard external and internal rotation exercises and modified external and internal rotation exercises in three ranges of abduction. Standard exercises were performed holding one elastic resistance band (Theraband) in the hand, whereas modified exercises incorporated the resistance of two elastic bands, one held in the hand and the other wrapped around the humeral head.

Outcome Measures: The percentage of the maximum voluntary isometric contraction for the three rotator cuff exercises during standard exercises were compared with modified exercises.

Results: Subscapularis performed at a higher intensity during the modified exercises overall, however only external rotation at 0° of abduction reached significance (p = 0.03). No significant differences were found in supraspinatus and infraspinatus muscle activity between the standard and modified exercises (p > 0.05).

Conclusion: The modified exercises may elicit greater muscle activity in anterior cuff muscle in a normal population. This simple modification may promote increased dynamic stability when performing rotator cuff exercises.

Key Practice Points:
- The modified shoulder external rotation exercise at 0° of abduction elicits higher subscapularis activity when compared to the standard exercise.
- A simple modification to standard rotator cuff exercises may promote increased dynamic stability of the glenohumeral joint.
- This modification could be relevant for patients with a reduced ability to maintain the humeral head centered within the glenoid.

A NEURO DEVELOPMENTAL TREATMENT APPROACH IN AQUATIC PHYSIOTHERAPY: A PAEDIATRIC CASE STUDY

Gavin S
Splash Physiotherapy

Key Practice Points:
- The NDT approach encourages detailed movement analysis and specific treatment choices to see changes within and between sessions.
- Aquatic physiotherapy treatment session goals, with pre and post assessment, aid clinical reasoning.
- Novel treatments can combine NDT, Halliwick and swimming teaching approaches with consideration of properties of the water and functional goals. Neuro Developmental Treatment can be used in aquatic physiotherapy to see change within and between sessions. An aquatic physiotherapy case study detailing one session with a 13 month old with cerebral palsy (right hemiplegia) is used to demonstrate this clinical reasoning process. Long term goals include reaching for a toy in prone with the right hand, with coordinated left weight shift and combined thoracic spine movements. On assessment, posture and movement strategies seen include difficulties in: shifting weight to the left; elongating the right arm; and in combining thoracic spine extension, rotation and lateral flexion. The components of these strategies can be strengths or impairments. Examples of primary impairments include thoracic spine joint stiffness into extension; and difficulty initiating and sustaining activation of thoracic spine extensors and obliques. Increased right arm flexor muscle tone right arm is an example of a secondary impairment. The treatment session goal relates to active left weight shift and attempted reach with the right hand. Treatment addresses primary impairments, combining strategies from Neuro Developmental Treatment, Halliwick, and swimming teaching, using the properties of the water.

Water awareness and swimming skills are developmentally appropriate considerations with every child. Swimming independently or with an aid may be an important leisure or exercise option for many children with disabilities. Poolside reassessment of the task, and independent practise of the new movement patterns taken on during the session, aids carryover. The NDT approach encourages detailed movement analysis and specific treatment choices to see changes within and between sessions.

LEAD OR BE LED? SHOULD ELECTROTHERAPY BE TAUGHT IN A CONTEMPORARY ENTRY-LEVEL PHYSIOTHERAPY CURRICULUM?

Gibson W, Patman S, Connaughton J
School of Physiotherapy, The University of Notre Dame Australia, Fremantle

Questions: Increased content and expectations of commitment to evidenced-based education are recurrent themes in physiotherapy entry-level curricula. Electrotherapy remains a curriculum fixture in Australia despite a lack of high-quality evidence demonstrating clinical efficacy. This study asked the following key Questions: What electrotherapy is used most by clinicians? What electrotherapy modalities do clinicians want to learn more about? Does electrotherapy have sufficient evidence base to justify clinical use? Do clinical results justify ongoing use in practice? Should electrotherapy education remain part of the undergraduate curriculum?

Participants: 36 clinicians associated with the School of Physiotherapy were invited to complete an online questionnaire. 70 respondents completed the full survey.

Outcome Measures: The questionnaire consisted of 15 items including closed, open and Likert response-type questions.

Results: Modalities most frequently used by clinicians were: therapeutic ultrasound, heat/cold, TENS, and real-time ultrasound. Clinicians rated the same four modalities as the most important modalities to teach and 85% of respondents felt the evidence-base was inadequate to justify clinical use of electrotherapy modalities. Conversely, 5% of respondents stated clinical results obtained justified clinical use and 9% of respondents thought electrotherapy should remain a part of physiotherapy entry-level curriculum.

PATIENT CENTRED CARE IN CHRONIC LOW BACK PAIN – FEASIBILITY AND EFFICACY

Gardner T1, Refshauge K2, McAuley J3, Goodall S4, Huebscher M4, Smith L4
1Faculty of Health Sciences, Sydney University, Sydney, Australia
2Neuroscience Research Australia, Sydney, Australia
3Centre for Health Economics Research & Evaluation, University of Technology Sydney, Sydney, Australia
4Faculty of Pharmacy, Sydney University, Sydney, Australia

Question: Is a patient-centred goal-setting approach a feasible and effective intervention for the management of chronic low back pain?

Design: Pilot cohort study

Participants: 14 participants experiencing chronic low back pain

Intervention: Participants were involved in a patient-led goal-setting intervention, facilitated by the physiotherapist over a 2 month period. Participants, guided by the therapist, identified problem areas, defined goals and developed strategies to achieve the goals. Participants implemented the strategies independently between sessions.

Outcome Measures: Primary outcome measures of disability and pain intensity were measured at baseline, 2 months and 4 months. Secondary measures of quality of life, stress and anxiety, self-efficacy and fear of movement were also taken. Problem areas, goals and strategies developed were also recorded.

Results: Both the average disability and pain intensity reported by participants improved from pre-treatment to the completion of the 2 month intervention. These results were maintained for at least 6 months. On each measurement occasion, average Quebec disability questionnaire scores were: baseline (33.8 SDD 7.2) months (17.4 SDD 1.6), 4 months (14.4 SDD 1.4); and pain intensity (VAS) scores were: baseline (6.3 SDD 2.8), 2 months (3.2 SDD 2.4), 4 months (3.1 SDD 1.8).

Conclusion: Our findings show that a patient-centred goal-setting intervention is a feasible and potentially effective intervention for the management of chronic low back pain with significant improvements in both quality of life and pain intensity.

Key Practice Points:
- There is no identified effective treatment for the management of chronic low back pain.
- Patient centred goal setting has not been investigated for the management of chronic low back pain.
- A patient centred goal setting approach is feasible, and provides improvements of large effect size in quality of life and pain intensity for patients with chronic back pain.
UES PRIMARY CONTACT PHYSIOTHERAPY PATIENTS CAN PROBABLY BE SEEN

Primary contact physiotherapy patients are seen and treated in a key practice points:

1. Universities face increasing demand upon curriculum in terms of content.
2. Electrophysiotherapy has limited supporting evidence yet clinicians feel it provides worthwhile results and want it to remain a part of physiotherapy undergraduate education.
3. Universities may in the future be forced to make a choice between meeting consumer demand and shaping the future profession through education.
4. This is a conversation the whole profession has a stake in and should engage with.

Dr W Gibson graduated from Glasgow Caledonian University in Scotland in 1986. Following this he worked in the NHS in Scotland before moving to New Zealand and working in private practice for three years. A Masters in Manipulative Therapy followed this in 2000 at Melbourne University. This was closely followed by a journey across the Nullarbor to Perth where four years of private practice work beckoned. A PhD in Denmark was the next career development and was completed in 2007. On return to Perth he has worked as a lecturer and researcher and is currently a Senior Lecturer in the School of Physiotherapy at University of Notre Dame Australia. He has a strong interest in all matters related to teaching and learning as well as curriculum review and design.

EVALUATING THE EFFECTS OF AN EMERGENCY DEPARTMENT PRIMARY CONTACT PHYSIOTHERAPY SERVICE ON WAITING TIME AND LENGTH OF STAY

Gill SD, Bella J

Barwon Health, Geelong

Question: What impact does primary contact physiotherapy have on waiting time and length of stay for people presenting to emergency departments with musculoskeletal conditions?

Design: Retrospective cohort study comparing waiting time and length of stay data to the Australasian College for Emergency Medicine guidelines, and approximately 90% of patients were seen within the Australasian College for Emergency Medicine guidelines.

Participants: People presenting to the Geelong Hospital emergency department with a musculoskeletal condition such as sprain, strain, or fracture between 1 October 2008 and 30 September 2011.

Intervention: Participants were assessed and treated by a primary contact physiotherapist.

Outcome Measures: Waiting time to be seen and length of stay for patients discharged home.

Results: 5641 patients were seen by the primary contact service. Approximately 90% of patients were seen within the Australasian College for Emergency Medicine guidelines, and approximately 90% of patients who went home were discharged within four hours, well above the Victorian Department of Health’s 2013 target of 75%. When compared to patients seen by medical staff, patients seen by the physiotherapy practitioner service had shorter waits to be seen and shorter length of stay (p < 0.01).

Conclusion: Patients seen by the primary contact physiotherapy service had favourable waiting times and length of stay relative to Australasian College for Emergency Medicine and Victorian Department of Health targets, and although constrained by a retrospective non-randomised design, to a similar group of patients seen by medical staff.

Key Practice Points:

1. Primary contact physiotherapy patients are seen and treated in a timely fashion.
2. Primary contact physiotherapy patients can probably be seen and treated at least as quickly as medical staff.
3. Further evaluation of the physiotherapy service is required using prospective controlled designed and a broader range of outcome measures.

PHYSIOTHERAPY REHABILITATION OF A GREAT DANE FOLLOWING SNAKE BITE

Goff L

Active Animal Physiotherapy

Key Practice Points: physiotherapy; paraplegic; dog

An eighteen month old Great Dane was bitten multiple times by an Eastern Brown Snake in September 2012. He survived, but 24 hours later was paraplegic. This 5 x 5 presentation outlines the physiotherapy treatment provided over a 12 week period, that resulted in the successful rehabilitation of the dog.

EVALUATION OF A PHYSIOTHERAPY SERVICE DELIVERED TO POST-ACUTE COMMUNITY REHABILITATION CLIENTS THROUGH A TRANSITION CARE PROGRAM

Goodwin S1, Kim A1, Lackie R1, Ayres E1, Steele M1, Low Choy N2

1Department of Physiotherapy, Transition Care Program, Gold Coast Hospital and Health Service
2Faculty of Health Sciences and Medicine, Bond University, Gold Coast

Question: Do client groups differ in the amount and mode of physiotherapy services delivered in a Transition Care Program and is a positive clinical outcome achieved?
Design: A retrospective audit of physiotherapy services provided to Transition Care clients from August 2011 to March 2012 was undertaken.

Participants: Data from 132 clients were categorised by diagnosis (Orthopaedic, Neurological, Medical/Surgical/Trauma groups) and outcomes were compared.

Intervention: Centre and home-based interventions were delivered using one-on-one sessions and classes.

Outcome Measures: Demographics, length of stay (days), mode of treatment, location of treatment, service time and clinical measures were recorded. Total physiotherapy service time included physiotherapist, allied health assistant, joint visits, individual or classes, home or centre-based activity (mins). The Modified Barthel Index, Timed Up and Go and Balance Outcome Measures for Elder Rehabilitation identified clinical outcomes.

Results: Total physiotherapy service time averaged 11.2mins/day, with the Medical/Surgical/Trauma Group receiving significantly less time than other groups (p < 0.002). Direct contact by a physiotherapist averaged seven occasions of service with 51.2mins per visit. Groups differed in mode and location of treatment. Significantly more individualized services (74%) than classes (26%) (p < 0.001), and more home treatments (66%) than centre-based (34%) (p < 0.001) occurred. At discharge, clients required less assistance in activities of daily living, walked faster and demonstrated a clinically significant improvement in balance scores.

Conclusion: This audit showed differences in physiotherapy service delivery for different client groups as well as functional, balance and mobility improvements for different low-intensity physiotherapy resources. These findings may help guide other community-based Transition Care Programs.

Key Practice Points:
• Direct contact by a physiotherapist averaged seven occasions of service, with 51.2 minutes per visit.
• Low-intensity total physiotherapy rehabilitation for Transition Care clients averaged 11.2 minutes per day, with Medical/Surgical/Trauma Group receiving significantly less service time.
• Transition Care physiotherapy services delivered a clinically significant improvement in functional outcomes.

LOW PHYSICAL ACTIVITY LEVELS AND FUNCTIONAL DECLINE IN INDIVIDUALS WITH NON-SMALL CELL LUNG CANCER

Granger CL, McDonald CF, Irving L, Clark RA, Denney L
1Department of Physiotherapy, The University of Melbourne, Melbourne
2Department of Physiotherapy, Royal Melbourne Hospital, Melbourne
3Department of Respiratory and Sleep Medicine, Royal Melbourne Hospital, Melbourne
4Department of Respiratory and Sleep Medicine, Royal Melbourne Hospital, Melbourne
5Department of Respiratory and Sleep Medicine, Royal Melbourne Hospital, Melbourne

Questions: How active are people with non-small cell lung cancer (NSCLC) compared to similar-aged healthy individuals? Is there a difference in outdoor activity, depression or motivation to exercise? Is there a relationship between physical activity (PA) and depression in NSCLC?

Design: Prospective observational study.

Participants: Fifty individuals from three tertiary hospitals with stage I–IIIB NSCLC (32 males) and 35 similar-aged healthy individuals without cancer (19 male) were assessed once.

Results: At diagnosis, individuals with NSCLC engage in less physical activity (PA) guidelines at 2363 steps/day, p = 0.01. Daily outdoor walking time (p = 0.87) and distance traveled away from home (p = 0.88) were not different between groups. Individuals with NSCLC spent less time outdoors in their local neighbourhood area (p < 0.001). Additionally, individuals with NSCLC had higher levels of depression (p = 0.03) and lower motivation to exercise (p = 0.001) than healthy controls. People who were more active, had lower levels of depression (r = 0.39).

Conclusion: Individuals with NSCLC are less active than similar-aged healthy individuals and spend less time outdoors in their local neighbourhood. Despite this, there is no difference in the time spent walking outdoors groups. Studies are needed to investigate the efficacy of interventions to enhance PA in NSCLC.

Funding: Victorian Cancer Agency and Eirene Lucas Foundation.

Key Practice Points:
• Individuals with NSCLC, before commencing treatment, are less active, weaker and have worse nutrition than similar-aged healthy individuals.
• Over six months individuals with NSCLC experience a decline in activity, functional capacity and strength.
• Studies are needed to investigate potential interventions to minimize functional decline in NSCLC.

GLOBAL POSITIONING SYSTEM TRACKING IN NON-SMALL CELL LUNG CANCER: COMPARISON OF PHYSICAL ACTIVITY BEHAVIOUR TO HEALTHY CONTROLS

Granger CL, McDonald CF, Irving L, Clark RA, Denney L
1Department of Physiotherapy, The University of Melbourne, Melbourne
2Institute for Breathing and Sleep, Melbourne
3Department of Physiotherapy, Royal Melbourne Hospital, Melbourne
4Department of Respiratory and Sleep Medicine, Austin Health, Melbourne
5Department of Respiratory and Sleep Medicine, Royal Melbourne Hospital, Melbourne

Questions: How active are individuals with newly diagnosed non-small cell lung cancer (NSCLC) compared to similar-aged healthy individuals? Is there a difference in outdoor activity, depression or motivation to exercise? Is there a relationship between physical activity (PA) and depression in NSCLC?

Design: Prospective observational study.

Participants: Fifty individuals from three tertiary hospitals with stage I-IIIB NSCLC (32 males) and 35 similar-aged healthy individuals without cancer (19 male) were included.

Outcome Measures: Primary measures were tri-axial accelerometry (steps/day) and global positioning system (GPS) tracking (outdoor PA behaviour). Secondary measures were questionnaires (mood, exercise motivation and environmental barriers to PA).

Results: Individuals with NSCLC engaged in significantly less PA than similar-aged healthy individuals (mean difference 2363 steps/day, p = 0.01). Daily outdoor walking time (p = 0.87) and distance traveled away from home (p = 0.88) were not different between groups. Individuals with NSCLC spent less time outdoors in their local neighbourhood area (p < 0.001). Additionally, individuals with NSCLC had higher levels of depression (p = 0.03) and lower motivation to exercise (p = 0.001) than healthy controls. People who were more active, had lower levels of depression (r = 0.39).

Conclusion: Individuals with NSCLC are less active than similar-aged healthy individuals and spend less time outdoors in their local neighbourhood. Despite this, there is no difference in the time spent walking outdoors groups. Studies are needed to investigate the efficacy of interventions to enhance PA in NSCLC.

Funding: Victorian Cancer Agency and Eirene Lucas Foundation.

Key Practice Points:
• Individuals with NSCLC before commencing treatment are less active, weaker and have worse nutrition than similar-aged healthy individuals.
• Higher levels of PA are associated with lower levels of depression in NSCLC.
• Studies are needed to investigate the potential role education/exercise may play in enhancing PA levels in NSCLC.
DOES A FOCUS ON PARTICIPATION AND PERSONAL GOAL ACHIEVEMENT HAVE AN IMPACT ON DEPRESSION IN THE FIRST YEAR AFTER STROKE?

Graven C1,2, Brock K1, Hill K3, Ames D4, Cotton S5, Joubert L1
1The University of Melbourne, Melbourne
2St.Vincent’s Hospital Melbourne, Melbourne
3Curtin University, Perth
4National Ageing Research Institute, Melbourne
5Oxygen Youth Health Research Centre, Melbourne

Question: Depression is a common sequelae following stroke. The effectiveness of goal-based interventions on post-stroke depression is largely unknown. What is the effectiveness of a client-centred, integrated approach to facilitating goal achievement in the first year post-stroke on depressed mood?

Design: This study was a randomised controlled trial that addressed ways to enhance participation in patient-valued activities and screened for adverse stroke sequelae, following discharge home from rehabilitation.

Intervention: The control group received treatment as determined by the treating rehabilitation team. In addition, the intervention group received: collaborative goal setting, review of goal achievement levels, written information provision, and further referral to relevant health services as required.

Outcome Measures: The primary outcome measure was depression, measured by the Geriatric Depression Scale (GDS-15 item), with depression defined as GDS ≥ 6 at 12 months post stroke.

Results: One-hundred and ten participants with the primary diagnosis of stroke were recruited. No significant groups differences were identified at baseline on all demographic and clinical variables. There was a significant difference between the two groups with respect to the rates of depression at 12 month post-stroke. The rate of depression in the intervention group (14.6%, n = 7) was significantly lower than the rate of depression in the control group (34.8%, n = 16), OR(1)=5.19, p = 0.023.

Conclusion: This model of community-based rehabilitation management proved effective in reducing the incidence of post-stroke depression. An integrated approach that takes into account the patient’s expressed valued activities should form a routine part of post-stroke management.

Key Practice Points:
• Screen for post-stroke depression
• Collaboratively devise goals into the participation domain, especially inclusive of patient valued activities
• Management should involve a targeted integrated approach that addresses arising sequelae into the chronic phase post-stroke

ARE BILATERAL AND UNILATERAL CLUBFEET COMPARABLE?

Gray K1,2, Gibbons PJ1,2, Little D1,2, Barnes E1,2, Burns J1,2
1The Children’s Hospital at Westmead, Sydney
2The University of Sydney

Clubfoot is a structural congenital disorder of the lower limb of unknown aetiology. The pooling of unilateral and bilateral data is a common occurrence in clubfoot research. However, as the cause of clubfoot is unknown, it is also unknown if bilateral clubfeet are comparable to unilateral clubfoot. Questions: Are bilateral clubfeet similar in severity to unilateral clubfoot? Are right and left feet of bilateral cases highly correlated?

Methods: Retrospective chart review.

Participants: 141 patients (216 feet) with idiopathic clubfoot.

Outcome Measures: Baseline Pirani Score.

Methods: Feet were compared in two ways. First using the total Pirani Score and secondly, as two groups, defined as either very severe (Pirani Score ≥ 5) or less severe (Pirani Score < 5).

Results: There were 66 unilateral cases and 75 bilateral cases. In bilateral cases, 75% had the same total Pirani score in both feet. 83% of bilateral cases were identified as having at least one very severe foot, compared to 56% of unilateral cases. In bilateral cases there was a strong, positive correlation between the right and left feet (r = 0.7) and the odds of being severe were 2.6 (95% CI 1.3 – 5.1, p = 0.007) times higher compared to the unilateral cases.

Conclusions: Bilateral clubfeet present as more severe than unilateral clubfoot. In bilateral cases, right and left feet are highly correlated. Clinicians and researchers should use caution when conducting and interpreting trials of clubfoot in which bilateral and unilateral data have been pooled.

Key Practice Points:
• The cause of bilateral and unilateral clubfoot is known.
• Clinically, bilateral clubfeet are more severe than unilateral clubfeet and bilateral clubfeet are highly correlated.
• Trials which pool unilateral and bilateral clubfoot data may over or underestimate treatment effects and results should be interpreted with caution.

OBJECTIVE ASSESSMENT OF TIBIALIS ANTERIOR TENDON TRANSFER SURGERY IN CLUBFOOT

Gray K1,2, Burns J1,2, Little D1,2, Bellemore M1,2, Gibbons PG1,2
1The Children’s Hospital at Westmead, Sydney
2The University of Sydney

Tibialis anterior tendon transfer is undertaken in children with clubfoot, who following initial correction, present with residual dynamic supination during gait. No reliable, objective measures exist to support the decision to progress to surgery.

Question: Can objective and reliable measures assist in identifying children with clubfoot who would benefit from tibialis anterior tendon transfer?

Design: Prospective observational study.

Participants: 20 children with clubfoot awaiting tibialis anterior tendon transfer were compared with 12 children with clubfoot not requiring surgery.

Outcome Measures: Dimeglio Scale, strength by hand-held dynamometry, foot alignment by Foot Posture Index, plantar pressure by Emed platform and Clubfoot Disease Specific Instrument questionnaire. Assessment was completed at baseline, three, six and 12 months post-surgery.

Results: At baseline, the surgical group displayed significantly worse inversion-to-eversion strength ratio (p < 0.001), Dimeglio Score (p = 0.001) and Clubfoot Disease Specific Instrument questionnaire (p = 0.008). A more supinated foot posture was identified on plantar pressure (p = 0.036) and the Foot Posture Index (p = 0.005). At three months post-surgery, there were significant improvements in the Clubfoot Disease Specific Instrument (p = 0.076) and a medial shift of plantar pressure during gait (p > 0.344). Inversion-to-eversion balance was restored by three months (p = 0.553) but overall strength was significantly reduced until 6 months post-surgery.

Conclusions: Objective and reliable measures can assist the physiotherapist in identifying clubfoot patients who may benefit from a tibialis anterior tendon transfer. Improvements continued until six months post-surgery and maintained at the 12 month follow-up.

Key Practice Points:
• Strength, foot alignment, and Clubfoot Disease Specific Index questionnaire can assist in identifying children with clubfoot who would benefit from tibialis anterior tendon transfer
• Improvements were observed over six months post-surgery and were maintained at the 12 month follow-up.
GROUP CLINICAL SUPERVISION: DEMONSTRATING HIGH LEVELS OF SATISFACTION WITH AN ONGOING INNOVATIVE PROGRAM FOR PHYSIOTHERAPISTS AT SYDNEY CHILDREN’S HOSPITAL RANDWICK

Gretch DA, Daley D
Sydney Children’s Hospital, Randwick, NSW

Questions: i) What is the ongoing impact of participating in a group clinical supervision program (GCSP) on clinical practice for physiotherapists at Sydney Children’s Hospital Randwick; ii) How do physiotherapists rate the quality and outcome of the supervision process.

Design: Single group pre and post intervention questionnaire and a subjective evaluation narrative.

Participants: Twenty one physiotherapists at Sydney Children’s Hospital Randwick excluding part time after hours staff.

Intervention: Participants were assigned to small groups which met for one hour per month for up to two years. Surveys were completed at 10 months and 24 months.

Outcome Measures: Questionnaire; 5 item Likert scale; 10 point rating scale; narrative analysis.

Results: Levels of challenge experienced by physiotherapists in their current work role ranged from 6 to 9 (mean 7.9) and levels of support ranged from 4 to 10 (mean 7.5). 20 out of 21 respondents reported a positive impact on professional and personal behaviour including self reflection, communication skills, team support and supervision of students and junior staff. One respondent did not find the program useful. 85% of participants felt satisfied with the supervision they received. 80% agreed that clinical skills, knowledge and attitudes relating to clinical practice were improved by clinical supervision. 76% agreed that their confidence as practitioners increased and 67% reported that supervision motivated group members to work on developing clinical skills.

Conclusion: Participation in a GCSP had a significantly positive impact on clinical practice, perception of challenge and support and interpersonal relationships.

Key Practice Points:
• Paediatric physiotherapists report high levels of satisfaction with group clinical supervision over a 2 year period
• The positive impact of group clinical supervision includes both professional and personal behaviour.
• Provision of clinical supervision in a group setting is effective and efficient.

SEARCHING FOR RISK FACTORS IN LOW BACK PAIN: INSIGHTS FROM A NEW TWIN CASE-CONTROL STUDY

Oliveira VC1, Ferreira ML1,2,3, Refshauge KM4, Maher CG1,3, Griffin AR5, Hopper J6, Ferreira PH7
1Faculty of Health Sciences, University of Sydney, 2141, Sydney
2The George Institute for Global Health, University of Sydney, 2050, Sydney
3Sydney Medical School, University of Sydney, 2050, Sydney
4Australian Twin Registry, Melbourne

Question: Can twins’ perceptions of the contribution of lifestyle and environmental factors to their, or their twin’s, low back pain assist in identifying potential causative factors for low back pain?

Design: Twin case–control survey study.

Participants: Twenty-four complete twin pairs (n = 48) from a convenience sample of twin pairs registered with the Australian Twin Registry, aged 18 years and above, and discordant for low back pain history.

Outcome Measures: In a telephone survey of approximately 30 minutes duration, open-ended questions encouraged participants to nominate factors that they believed were responsible for the difference in their experience of low back pain to that of their twin.

Results: The most frequent environmental factors reported by participants as contributors to within-twin-pair differences were those related to physical workload or stress of the lumbar spine. The adoption of different types of work was the most frequently reported factor, thought to explain these differences (n = 21/24 pairs, 88%), and included work related to heavy loads, lifting, manual tasks, awkward postures and gardening. 21% (n = 5/24 pairs) reported long periods of time spent sitting or standing, 54% (n = 13/24 pairs) reported single trauma or injury, and 63% (n = 15/24 pairs) reported physical activity as factors explaining within-pair differences.

Conclusion: This novel hypothesis-generated study found that risk factors related to the physical workload of the lumbar spine were perceived to play an important role in the development and recurrence of LBP.

Key Practice Points:
• Physical risk factors were perceived to play an important role in the development and recurrence of low back pain
• Studies that capture information on the specific domains of these risk factors may improve preventative programs
• Future studies with larger samples may elucidate previously unconsidered risk factors.

EARLY MOBILISATION OF PATIENTS WHO HAVE HAD A HIP OR KNEE JOINT REPLACEMENT REDUCES LENGTH OF STAY IN HOSPITAL: A SYSTEMATIC REVIEW

Guerra ML, Taylor NF1, Singh P2
1Physiotherapy Department, Eastern Health, Melbourne
2Department of Physiotherapy, La Trobe University, Melbourne

Question: Does early mobilisation of patients with hip or knee joint replacement reduce hospital length of stay?

Design: Systematic review with meta-analysis of randomised controlled trials.

Participants: Patients having total hip, total knee or unicompartmental knee joint replacements.

Intervention: Patients who mobilised (sat out of bed and/or walked) early post-operatively were compared to patients who received usual care/mobilised later post-operatively.

Outcome Measures: Primary outcome was length of stay measured in days. Secondary outcomes included impairment parameters (range of motion measured in degrees, strength measured in units of force, pain measured by a visual analogue scale, adverse events measured by number and type of complications) and health-related quality of life.

Results: 5 randomised controlled trials with 622 patients were included for review. A meta-analysis of 5 trials found that early mobilisation reduced length of stay of 1.8 days (95% CI 1.1 – 2.6) when compared to the comparison groups. In the majority of trials the early mobilisation group first sat out of bed within 24 hours post operatively and first walked within 48 hours post operatively. Individual trials reported benefits in range of motion, muscle strength and health-related quality of life in favour of early mobilisation. There was no increased incidence of negative outcomes or adverse events attributable to early mobilisation when compared to the comparison groups.

Conclusion: Early mobilisation post joint replacement surgery within 24 to 48 hours post operatively may reduce length of stay by 1.8 days. This positive gain was achieved without an increase in negative outcomes.

Key Practice Points:
• Early mobilisation (either sitting out of bed and/or walking) post hip or knee joint replacement can occur within the first 24 hours post surgery
• Early mobilisation can reduce length of stay
• Early mobilisation does not appear to increase adverse events or negative outcomes.
**IMPROVING ACCESS TO ELECTIVE JOINT REPLACEMENT SURGERY: A WAITLIST COHORT**


1. Senior Physiotherapist, Musculoskeletal Coordinator, Whilam Joint Replacement Centre, Fairfield Hospital, Prairiewood
2. Senior Physiotherapist, Musculoskeletal Coordinator, Whilam Joint Replacement Centre, Fairfield Hospital, Prairiewood
3. Orthopaedic Surgeon, Head of Department Fairfield/Liverpool Hospital Orthopaedic Department
4. Senior Research Fellow SWSLHD, Director, Whilam Orthopaedic Research Centre, Liverpool Hospital, Liverpool
5. Physiotherapist, Allied Health Director, Liverpool Hospital, Liverpool
6. Orthopaedic Surgeon, Director of surgical specialties, SWSLHD, Director, Whilam Orthopaedic Research Centre, Liverpool
7. Clinical Nurse Consultant Osteoarthritis, Fairfield Hospital, Prairiewood

**Question:** Can changes made to the pre admission process improve clients' access to elective total knee and hip replacement surgery?  
**Design:** Observational study.  
**Participants:** Patients with Knee or Hip Osteoarthritis waitlisted for primary elective joint replacement surgery.  
**Outcome Measures:** Number of clients waiting longer than elective joint replacement benchmark time (365 days), number of clients having surgery cancelled at pre admission appointment, number of clients escalated to surgery, client satisfaction and client complaints.  
**Results:** Implementation of changes to the preadmission process resulted in a reduction in people waiting longer than the benchmark period for joint replacement. This was reduced from 150 clients in June 2009 to 0 in June 2010. This improvement has been maintained through 2011 and 2012 data collection periods. The new process allows patients who require earlier intervention to be objectively identified, resulting in 205 clients escalated to earlier surgical intervention between January 2010 and December 2012. Preadmission cancellations were analysed for the period January - March 2011 and there was a 20% decrease in cancellations for the same period in 2012. Client complaints decreased from 16 to 5 from 2009 to 2012 and 98% of people surveyed were satisfied or very satisfied with their participation.  
**Conclusion:** Process changes to the pre operative management of clients awaiting elective primary total knee and hip replacement surgery at Fairfield Hospital was associated with improved access to surgery and enhanced patient satisfaction with the pre-operative process.  
**Key Practice Points:**  
- New model of care: Osteoarthritis Chronic Care Program was developed in consultation with the Agency for Clinical Innovation  
- Changing the pre admission process allows earlier identification and opportunity to assist clients.  
- Client centred, holistic, multidisciplinary musculoskeletal chronic disease management improves clients' access to elective joint replacement surgery and satisfaction with the preadmission process.

**PHYSIOTHERAPY FOR MS-PATIENTS IN PALLIATIVE CARE**

**Hagenes M**  
**Oppsalrkeliknen AS**

**Questions:** What do experienced physiotherapists emphasize during treatment of patients with multiple sclerosis (MS) in palliative care? Do any changes occur during treatment, and if so how is this reflected?  
**Design:** Open non-participating observation.  
**Participants:** Two physiotherapists who treated one patient each.  
**Results:** Patients with severe MS experience a constant change in function and the physiotherapists assess among other things mobility, muscle quality (such as tone) and pain to evaluate the patients' present condition. The physiotherapists are concerned with the patients' total situation and the focus of treatment is set by which changes the patients have experienced since the last treatment. They emphasize maintenance of mobility and if possible to increase joint range, normalize muscle tone, as well as maintenance of lung function. The physiotherapists emphasize that the patients should pain free and they try to achieve a symmetric lying position. This study also shows that the patients experience reduced contact with own body. They have for instance a reduced or changed experience of how their own arms and legs feel like.

**Conclusion:** This study shows that patients with severe MS experience a constant change in function, which may be presented by declined ability to move, changed perception of own body, increased spasticity, etc. This ever-changing state requires close supervision. Patients with severe MS also have potential for changes in a positive direction. The treatment given by physiotherapists contribute to reduce spasticity and tone, and also to increase joint range among the patients. The physiotherapists also contribute to maintenance of the patients' respiratory function.  
**Key Practice Points:**  
- Patients with severe MS experience a constant change in function  
- This ever-changing state requires close supervision by a skilled physiotherapist  
- MS patients in palliative care also have potential for changes in a positive direction  
- MS patients in palliative care requires a holistic and dynamic approach

**MULTIMODAL PHYSIOTHERAPY FUNCTIONAL RESTORATION VERSUS ADVICE FOR PEOPLE WITH SUBACUTE LUMBAR DISC HERNIATION AND ASSOCIATED RADICULOPATHY: A RANDOMISED CONTROLLED TRIAL**


1. Department of Physiotherapy, La Trobe University, Melbourne  
2. Department of Physiotherapy, Melbourne School of Health Sciences, The University of Melbourne

**Question:** For people with a clinical and radiological diagnosis of lumbar disc herniation and associated radiculopathy, is multimodal physiotherapy functional restoration more effective than guideline-recommended advice?  
**Design:** Multicenter, parallel group randomised controlled trial.  
**Participants:** Fifty-four participants with clinical features of radiculopathy (six-week to six-month duration) and imaging showing a lumbar disc herniation.  
**Interventions:** Participants were randomly allocated to receive either 10 sessions of multimodal physiotherapy functional restoration or two sessions of guideline-recommended advice over a 10-week period.  
**Outcome Measures:** Primary outcomes were activity limitation (Oswestry Disability Index), and separate 0-10 numerical pain rating scales for leg pain and back pain. Measures were taken at baseline and at 5, 10, 26 and 52 week follow-ups.  
**Results:** Linear mixed model analysis showed that activity limitation (Oswestry) improved more in the physiotherapy group than the advice group across the whole follow-up period (overall group x time interaction p = 0.049). Between-group differences for activity limitation favoured the physiotherapy group at 10-weeks (7.7; 95% CI 0.3 to 15.1) and 52-weeks (8.2; 95% CI 0.7 to 15.6). There was no overall group x time effect for pain scores, but back pain was significantly lower in the physiotherapy group relative to the advice group at 10-week follow-up (1.4; 95% CI 0.2 to 2.7).  
**Conclusion:** In people with lumbar disc herniation and associated radiculopathy, a multimodal physiotherapy functional restoration program led to greater reduction in activity limitation across a 52-week follow-up period, and faster reduction in back pain, relative to guideline-recommended advice.  
**Trial registration:** ANZCTR12609000205235.  
**Key Practice Points:**  
- For people with a clinical and radiological diagnosis of lumbar disc herniation and associated radiculopathy, multimodal physiotherapy functional restoration appears more effective than guideline-recommended advice.  
- The effect of this physiotherapy program relative to surgery, injections, or in a chronic population, is yet to be investigated.
**BARRIERS AND FACILITATORS RELATING TO EXERCISE REHABILITATION AMONG PEOPLE WITH LUMBAR DISC HERNIATION AND ASSOCIATED RADICULOPATHY: A QUALITATIVE STUDY**

**Hahne AJ**, Ford JI, Surkitt LD, Slater SL, Richards MC, Chan AY, Hinman RS, Taylor NF

1. Department of Physiotherapy, La Trobe University, Melbourne
2. Department of Physiotherapy, Melbourne School of Health Sciences, The University of Melbourne

**Question:** What are the barriers and facilitators relating to exercise rehabilitation among people with a clinical and radiological diagnosis of lumbar disc herniation and associated radiculopathy?

**Design:** Phenomenological analysis of semi-structured interviews alongside a randomised controlled trial.

**Participants:** Fifteen consecutive participants with clinical features of radiculopathy and imaging confirming a lumbar disc herniation.

**Interventions:** Participants received 10 sessions of multimodal physiotherapy functional restoration over a 10-week period.

**Outcome Measures:** One-on-one semi-structured interviews were conducted at the conclusion of the 10-week intervention period. Two researchers independently coded data to identify key themes relating to barriers and facilitators for exercise rehabilitation.

**Results:** Key facilitators of exercise were found to be the participants’ physiotherapist, their family, developing strategies to make exercise more manageable, and the participant possessing a desire to improve and to avoid surgery. Barriers to exercise were time, other injuries or illnesses, environmental factors and a lack of participant motivation. The participant’s primary injury and associated symptoms did not emerge as a key barrier to exercise.

**Conclusion:** A range of barriers and facilitators to exercise covering all domains of the biopsychosocial model were identified by people with disc herniation and associated radiculopathy. Interestingly, none of the barriers related to the participants’ primary patho-anatomical condition. A desire to avoid surgical intervention was the sole condition-related facilitator of exercise.

**Key Practice Points:**

- To maximise compliance with exercise rehabilitation programs, people with disc herniation and associated radiculopathy are likely to benefit from:
  - family support,
  - supervision by a physiotherapist,
  - motivational goal setting, and;
  - input into the design of their program to ensure that exercises are manageable and easy to incorporate into their lifestyle.

**ACUTE CARE WEEKEND PHYSIOTHERAPY AT A MAJOR METROPOLITAN TEACHING HOSPITAL**

**Haines KJ**, Rollinson T, Hibbert E, Hill CJ, Berney SC, Skinner EHT

1. Austin Health, Melbourne
2. Institute for Breathing and Sleep, Melbourne
3. Western Health, Melbourne
4. Allied Health Research Unit Monash University, Melbourne
5. The University of Melbourne

**Question:** What is usual care for acute care physiotherapy on weekends in a major metropolitan teaching hospital?

**Design:** Prospective observational study nested within larger intensive care discharge? Does an objective scoring tool, the Functional Comorbidity Index, correlate with physical function?

**Outcome Measures:** 5-item prediction questionnaire, the Functional Comorbidity Index.

**Participants:** Physicians, physiotherapists and nurses caring for patients at intensive care discharge.

**Conclusion:** Experienced intensive care physicians are able to predict morbidity and mortality outcomes with a high degree of accuracy. This may be useful to identify patients in whom it would be more beneficial to direct early rehabilitation toward such as patients most likely to survive, return home and have a good quality of life in the longer term. Future studies could consider using the Functional Comorbidity Index and the Physical Component Score of the Short-Form 36 version two (r = -0.60).

**Key Practice Points:**

- Experienced intensive care physicians are able to predict mortality and mortality outcomes with a high degree of accuracy. This may be useful to identify patients in whom it would be more beneficial to direct early rehabilitation toward such as patients most likely to survive, return home and have a good quality of life in the longer term. Future studies could consider using the Functional Comorbidity Index as an objective estimate of physical function following intensive care.

HOW WELL CAN INTENSIVE CARE CLINICIANS PREDICT LONGER TERM OUTCOMES FOR THEIR PATIENTS?

**Haines KJ**, Berney SC, Warrillow, S, Denhey, L

1. Austin Health, Melbourne
2. The University of Melbourne, Melbourne

**Questions:** How well can intensive care clinicians predict patient prognosis (using the Sabadell score), mortality, discharge destination and health related quality of life at one year post intensive care discharge? Does an objective scoring tool, the Functional Comorbidity Index, correlate with physical function?

**Results:** There was poor agreement between the clinicians’ prediction of prognosis and patient outcome with no kappa exceeding 0.2. Sensitivity of the physicians’ predictions for mortality was the highest [83% (95% CI 78 to 91%)] whilst the physiotherapists’ predictions had the greatest specificity [100% (95% CI 89 to 100%)]. Sensitivity of the physicians’ predictions for patients who would not return home was the highest [89% (95% CI 93 to 98%)] whilst all clinicians were comparable in predicting who would return home. Physicians were more accurate than physiotherapists in predicting future health related quality of life (p = 0.04). There was good correlation between the Functional Comorbidity Index and the Physical Component Score of the Short-Form 36 version two (r = -0.60).

**Conclusion:** Experienced intensive care physicians are able to predict morbidity and mortality outcomes with a high degree of accuracy. This may be useful to identify patients in whom it would be more beneficial to direct early rehabilitation toward such as patients most likely to survive, return home and have a good quality of life in the longer term. Future studies could consider using the Functional Comorbidity Index as a tool to predict physical function following intensive care.
THE PHYSICAL AND PSYCHOLOGICAL OUTCOMES OF AUSTRALIAN SURVIVORS OF INTENSIVE CARE AT FIVE YEARS: PRELIMINARY RESULTS

Haines KJ1, 2, Berney SC1, 2, Remedios L2, Skinner EH3, Denney L2

1 Austin Health, Melbourne
2 The University of Melbourne, Melbourne
3 Western Health, Melbourne

Questions: What are the mortality rates, caregiver requirements, physical function and health-related quality of life outcomes in patients five years following intensive care discharge? What is the long-term prevalence of anxiety, depression and post-traumatic stress disorder?

Design: Prospective observational follow-up study of a randomised controlled trial cohort five years following intensive care discharge.

Participants: 78 patients admitted to the intensive care unit for five days or longer.

Outcome Measures: Mortality; proportion of patients requiring a caregiver; validated and reliable physical (Six-Minute Walk Test, Timed Up and Go Test) and psychological outcomes (health-related quality of life (Assessment of Quality of Life); depression/ anxiety (Centre for Epidemiological Studies Depression, Hospital Anxiety and Depression Scale); and post-traumatic stress disorder (Impact of Events Scale) five years following intensive care unit discharge.

Results: 42% were deceased; 9% refused; 8% were unable to be contacted; 6% were presumed deceased and 35% of the sample was alive. The survivors mean (SD) age was 65.8 (14.9) years; 67% male and 33% female had a caregiver. Survivors reported good functional capacity (mean (SD) six-minute walk distance 474.6m (151.0)); Timed Up and Go test 7.1 seconds (2.4); Survivors reported good health-related quality of life (mean (SD) health utility 0.69 (0.30)); 33% and 11% reported mild or major depression respectively; 15% reported mild or moderate anxiety and 19% and 11% reported mild or moderate/severe post-traumatic stress disorder respectively.

Conclusion: This is the first Australian study to report on long-term outcomes of survivors. These preliminary results indicate that survivors have good functional capacity, report good quality of life and have mild to moderate psychological morbidity following intensive care.

Key Practice Points:

• This is the first study to investigate the physical and psychological outcomes of survivors of intensive care in an Australian setting.

• A significant proportion of patients are unable to be followed up and this bias is reflected in the results, although survivors achieve good outcomes.

• These preliminary results indicate that survivors of intensive care have good physical function, report good quality of life and experience mild to moderate psychological morbidity following a prolonged intensive care admission.

A NOVEL INTERVENTION TO IMPROVE BALANCE AND ACTIVITY PARTICIPATION FOR ADULTS WITH INTELLECTUAL DISABILITY: A FEASIBILITY STUDY

Hale L1, Mirfin-Veitch B2, Treharne GJ3

1 Centre for Health, Activity, and Rehabilitation Research, University of Otago, Dunedin, New Zealand
2 Donald Beasley Institute, Dunedin, New Zealand
3 Psychology Department University of Otago, Dunedin, New Zealand

Questions:

What are the effects on balance and activity participation, and feasibility, of a novel exercise-based intervention for adults with intellectual disability?

Design: A feasibility study using a non-controlled, before-after clinical design.

Participants: 29 adults (13 males, 16 females; age range 29-71 years, mean 53 years) with a wide range intellectual disability (mild to profound), known risk of falling but independently ambulant with or without assistive devices.

Intervention: The programme comprised a workshop for participant support staff on the importance of regular physical activity and exercise, and three home visits and ongoing telephone support from a physiotherapist. In the home visits, two to three individualised exercises to challenge balance were taught and monitored. Exercises were intended to be performed 5-10 times daily as part of regular daily routine. Participants also chose a physical activity to participate in weekly.

Outcome Measures: Outcome measured at baseline and six months were: Tinnetti Balance and Gait Instrument, Video-based Balance Scale for Intellectual Disability, Berg Balance Scale, Index of Participation in Domestic Life Questionnaire, and Index of Community Involvement Questionnaire.

Results: Only the Video-based Balance Scale for Intellectual Disability improved significantly (p = 0.04). A trend towards significance existed for the Index of Participation in Domestic Life Questionnaire (p = 0.06). Appropriate exercises and a physical activity could be found for all participants, irrespective of level of intellectual disability, but often required innovation and support worker assistance.

Conclusion: As our intervention was achievable and potentially beneficial, further research of effectiveness is justified.

Key Practice Points:

• Adults with a wide range of intellectual disability can participate in exercise and physical activity.

• Regular engagement in exercise and physical activity can improve balance of adults with intellectual disability.

• People supporting adults with intellectual disability need to be educated on the benefits of exercise so they facilitate regular engagement of those they support.
WHICH FACTORS INFLUENCE THE PHYSICAL ACTIVITY LEVELS OF PEOPLE WITH TRAUMATIC BRAIN INJURY WHEN THEY ARE DISCHARGED HOME FROM HOSPITAL?

Hamilton M1, Williams G1, Bryant A2, Clark R3, McGuigan S4
1Epworth Healthcare
2The University of Melbourne

Question: Which factors influence the physical activity levels of people with traumatic brain injury when they are discharged home from hospital?

Design: A prospective observational study of consecutive admissions.

Participants: Twenty people with traumatic brain injury transitioning home following inpatient rehabilitation.

Intervention: Not applicable.

Outcome Measures: Activity levels (steps/day) were measured using Kinetamap activity monitors at three times: the weeks preceding and following discharge and six weeks post discharge. The following potential community mobility predictive factors were measured preceding discharge: high level mobility (High-Level Mobility Assessment Tool), walking endurance (six minute walk test), balance (Balance Error Scoring System), lower limb strength (Upright Motor Control), cardiovascular fitness (Monark bike Physical Work Capacity-130), anxiety and depression (Hospital Anxiety Depression Scale), fatigue (Fatigue Severity Scale), motivation to exercise (Behavioural Regulation in Exercise Questionnaire-2) and functional cognition (Supervision Rating Scale).

Results: All participants were well below the Australian National Guidelines of 10,000 steps/day (mean steps/day = 5166 ± 3053). Activity levels decreased during the first week post discharge and took six weeks to reach pre-discharge levels. Only the relationship between motivation to exercise (BREQ-2) and steps/day at six weeks post discharge was significant (Spearman’s rho = 0.738, p < 0.001).

Conclusion: Although a range of physical and non-physical factors were considered, motivation to exercise was the only variable with a significant relationship to activity levels at six weeks post discharge. Further data are required to identify predictors of community activity levels, which in future could be used to improve rehabilitation and community integration outcomes.

Key Practice Points:
• Activity levels of people with traumatic brain injury transitioning home are well below the recommended standards.
• Motivation to exercise influences activity levels of people with traumatic brain injury at six weeks post discharge from inpatient rehabilitation.
• Exercise self efficacy and motivation are priorities for therapeutic intervention.

A CASE STUDY OF RECOVERY POST ACQUIRED BRAIN INJURY: WHERE DOES RECOVERY END?

Hancock JA, Thomas BM, Brandtman T
Kids Rehab, The Children’s Hospital at Westmead, Sydney

The goal of rehabilitation post brain injury is optimising the long term physical, cognitive and social outcomes for an individual. Rehabilitation starts in the acute (hospital-based) phase, is characteristically intense immediately post discharge, and then interventions lessen and cease with time. The first 12-24 months post brain injury (or neurological insult) is often viewed as the critical period to “rehabilitate.” For children who sustain an acquired brain injury (ABI) in their formative years, their pattern of recovery is made more complex and prolonged by the process of physical, cognitive and social development and their inevitable maturation. This presentation will review the current physiotherapy guidelines for the management of ABI, and discuss the current Physiotherapy practices in a large metropolitan paediatric Brain Injury Service. A case will be presented (including videos) of a 15 year old boy, 10 years post hemispherectomy for Rasmussen’s encephalopathy. Subjective and objective outcomes, physical and other, pre and post implementation of a gym based program will be presented. Pertinent issues and current evidence related to long term outcomes in the paediatric ABI population will be discussed, including school and community participation, weight management, cognitive function and family burden. This presentation will also present a proposed data registry for children with ABI, and will promote discussion regarding long term management of children with ABI.

Key Practice Points:
- acquired brain injury, paediatric, rehabilitation

PREDICTING RAPID RECOVERY FROM ACUTE LOW BACK PAIN: A VALIDATION STUDY

Hancock MJ1, Williams CM2, Maher CG2, McAuley JH3, Lin C2, Latimer J2
1Faculty of Human Sciences, Macquarie University, Sydney
2The George Institute for Global Health, University of Sydney, Sydney
3Neuroscience Research Australia, Sydney

Question: Does a three-item clinical prediction rule for estimating the probability of rapid recovery from acute low back pain, generalise in a new sample.

Design: A pre-planned external validation using data from consecutive participants enrolled in a randomised controlled trial investigating the effectiveness of paracetamol for back pain.

Participants: Nine hundred and fifty-six participants who sought care from a primary care clinician for acute LBP.

Outcome Measures: Status on the prediction rule was determined for each participant by calculating the number of predictors of recovery present at baseline (baseline pain ≤ 7/10; duration of current symptoms ≤ 5 days; number of previous episodes of low back pain ≤ 1)). The primary outcome ‘recovery from low back pain’ was defined as a score of 0 or 1 out of 10 on a numerical pain rating scale for seven consecutive days. Participants recorded pain scores in a daily pain diary until recovery, or for a maximum of 12 weeks.

Results: The calibration of the rule was reasonable with predictions of recovery typically within 5-10% of observed recovery. Discriminative performance of the prediction rule was moderate (c index = 0.65 at week one and 0.63 at week two) and similar to that found in the development sample.

Conclusion: The results suggest that the rule provides accurate short term information about expected recovery time from acute low back pain, in patients presenting to primary care. The rule has potential to be used by clinicians and their patients to assist informed treatment decisions based on expected recovery time.

Key Practice Points:
• A simple clinical prediction rule can help estimate likely recovery time for people with acute low back pain
• Some people with acute low back pain recover rapidly and minimal intervention may be required
• Information on likely recovery time can help clinicians and patients make informed decisions about treatment
EVALUATING THE IMPACT OF INTRODUCING A PHYSIOTHERAPIST LED SHOULDER CLINIC

Harding DB1, Molloy R2, O’Keeffe DD3, Turner JA4
1Physiotherapy Department Monash Medical Centre
2Physiotherapy Department Dandenong Hospital, Monash Health, Melbourne

Questions: What is the impact of introducing a physiotherapist led shoulder clinic on hospital waiting lists? What therapeutic approaches are employed? What is the patient response to consultation with a physiotherapist instead of a surgeon?

Design: Retrospective clinical dataset interrogation with cross sectional survey


Intervention: A physiotherapist assessed and determined the intervention required for patients instead of an orthopaedic surgeon in the orthopaedic clinic. Interventions included no further intervention, conservative management (physiotherapy), or referral to an orthopaedic surgeon. Measurements: Waiting list data extracted from outpatients database. Therapeutic approaches employed by the physiotherapist were collected on a custom developed database. These were coded as no further intervention, conservative management (PT), referral to surgeon. Cross sectional survey included items: 1. I expected to see the orthopaedic surgeon at the clinic, 2. I would have preferred to see an orthopaedic surgeon, 3. Overall I was satisfied with the visit N=39.

Results: Waiting list reduced from 399 in January 2012 to 20 in December 2012. Therapeutic approaches: Proportion of patients requiring surgical review in future (31%), conservative management (53%), discharged (40%). Of those having conservative treatment 22% required surgery. Survey Results: 3 key items from patient surveys.

Conclusion: Clinic reduced waiting lists, was well accepted by a majority of patients, and those who preferred to have consulted a surgeon were happy with the service provided.

Key Practice Points:
• Physiotherapist Led Orthopaedic Clinics can lead to a reduction in waiting lists in an orthopaedic service
• Patients expected to see an orthopaedic surgeon but demonstrate overall satisfaction with the service when provided by a physiotherapist
• Despite referral for conservative management of shoulder pain some patients will still require surgical management

PHYSICAL ACTIVITY PERCEPTIONS AND BELIEFS FOLLOWING TOTAL HIP AND KNEE ARTHROPLASTY: A QUALITATIVE STUDY

Harding P1, Delany C2, Hinman R2, Holland A1
1The Alfred Hospital
2The University of Melbourne

Question: What are the factors, from a participant’s perspective, that influence physical activity at six months following total hip or knee arthroplasty? What skills, knowledge and attributes are required to be a competent physiotherapist working in Advanced Musculoskeletal Physiotherapy Services (inclusive of physiotherapy-led orthopaedic and neurosurgical clinics, primary contact physiotherapy in the Emergency Department, post-operative physiotherapy-led clinics and osteoarthritis hip and knee services) in Victorian public hospitals? How do we assess competency of physiotherapists working in these roles?

Method: A series of three focus groups were conducted. Data from the first focus group were categorized, coded, and emerging themes identified. A conceptual three dimensional model of skills, knowledge and attributes required for these roles was developed based on these themes. Using this model, results of a literature review, and the guidance of a physiotherapist trained in competency assessment, a competency-based resource was developed. This resource was presented to participants for verification and refinement in the following two focus groups.

Results: A flexible competency-based resource, adaptable according to individual and organisational needs and to the specific area of Advanced Musculoskeletal Physiotherapy, was developed.

Conclusion: This competency resource has been successfully implemented in seven hospitals participating in the Health Workforce Australia, Physiotherapists in the Emergency Department Project. It is anticipated this resource will be implemented more widely in public hospitals and provide a robust, transferable and consistent approach to assessment of competency of physiotherapists working in Advanced Musculoskeletal Physiotherapy roles.

Key Practice Points:
• The skills, knowledge and attributes of a competent Advanced Musculoskeletal Physiotherapist are presented in a conceptual model.
• This competency resource is an end product of this qualitative study.
• This competency resource is adaptable for all Advanced Musculoskeletal Physiotherapy Services, the individual and local public hospital organisations.

ADVANCED MUSCULOSKELETAL PHYSIOTHERAPY IN PUBLIC HOSPITALS: COMPETENCY BASED LEARNING AND ASSESSMENT RESOURCE DEVELOPMENT – A QUALITATIVE STUDY

Harding, P1, Prescott, J1, Pearce, A2
1The Alfred Hospital
2Monash Health

Question: What are the factors, from a participant’s perspective, that influence physical activity at six months following total hip or knee arthroplasty? What skills, knowledge and attributes are required to be a competent physiotherapist working in Advanced Musculoskeletal Physiotherapy Services representing 10 Victorian public hospitals.

Method: A series of three focus groups were conducted. Data from the first focus group were categorized, coded, and emerging themes identified. A conceptual three dimensional model of skills, knowledge and attributes required for these roles was developed based on these themes. Using this model, results of a literature review, and the guidance of a physiotherapist trained in competency assessment, a competency-based resource was developed. This resource was presented to participants for verification and refinement in the following two focus groups.

Results: A flexible competency-based resource, adaptable according to individual and organisational needs and to the specific area of Advanced Musculoskeletal Physiotherapy, was developed.

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Key Practice Points:
• The skills, knowledge and attributes of a competent Advanced Musculoskeletal Physiotherapist are presented in a conceptual model.
• This competency resource is an end product of this qualitative study.
• This competency resource is adaptable for all Advanced Musculoskeletal Physiotherapy Services, the individual and local public hospital organisations.
PHYSICAL ACTIVITY FOLLOWING TOTAL HIP AND KNEE ARTHROPLASTY: A QUANTITATIVE STUDY

Harding P1,2, Himan R2, Holland A1, Delany C2
1The Alfred Hospital
2The University of Melbourne

Question: Do people with osteoarthritis who undergo total hip or knee arthroplasty gain improvements in physical activity of sufficient magnitude to promote good health and well-being?

Study Design: A prospective, within-group, pre and post intervention research design was used.

Outcome Measures: Physical activity was measured using accelerometers over seven days pre-operatively and at six months following total hip or knee arthroplasty. Self-reported questionnaires were used to assess pain (Visual Analogue Scale), physical function (Oxford hip and knee score), quality of life (SF12) and physical activity (UCLA Activity Scale).

Participants: Sixty-three people (mean age 68.8 years, range 51-80) with hip or knee arthroplasty awaiting surgery, were recruited.

Results: Pre-operatively, the median percentage of a 24-hour day spent by participants in sedentary activity was 82.3% (IQR7.8) compared to 83.0% (IQR 8.2) at six months post-operatively (p = 0.11). None of the participants met the Australian Physical Activity Guidelines preoperatively, and at 6 months post-operatively, one out of 52 (2%) participants met the guidelines despite self-reported improvements in pain, physical function, quality of life, and physical activity. Discussion: In this sample of people, successful surgery for hip and knee osteoarthritis did not appear to influence objectively measured physical activity.

Children with Cerebral Palsy and Periventricular White Matter Injury: Does Gestational Age Affect Functional Outcome?

Harvey A1,2,3, Randall M1,2,3, Imms C1,2, Eldridge B1,3, Rodda J1,3, Reid S1,2,3, Lee KJ1,2, Reddihough D1,2,3
1Royal Children’s Hospital, Flemington Road, Parkville
2Murdoch Childrens Research Institute, Parkville
3University of Melbourne, Parkville

Questions: Do children aged 4-12 years with cerebral palsy and periventricular white matter injury born after 34 weeks gestation differ in functional profile and movement disorder pattern compared with those born earlier?

Design: Prospective observational study.

Participants: One hundred and nine children with cerebral palsy and periventricular white matter injury. There were 49 children born after 34 weeks (65% males, mean age 8 years 9 months) and 60 born at or before 34 weeks (62% males, mean age 8 years 2 months).

Outcome Measures: Functional profiles were determined using the Gross Motor Function Classification System, Manual Abilities Classification System, Communication Function Classification System, Functional Mobility Scale and Bimanual Fine Motor Function. Movement disorder and topography were classified using the Surveillance of Cerebral Palsy in Europe classification.

Results: There was evidence of differences between the groups for the Gross Motor Function Classification System (p = 0.003), Manual Abilities Classification System (p = 0.04) and Communication Function Classification System (p = 0.035). A greater proportion of children born at or before 34 weeks had more severe limitations compared with children born later. There were no differences for Bimanual Fine Motor Function (p = 0.05) or movement disorder (p = 0.4).

Conclusion: These results suggest that insults affecting the periventricular white matter in children with cerebral palsy result in less severe limitations in gross motor function, mobility, manual ability and communication for those with longer gestations.

Key Practice Points:
- Children with cerebral palsy and white matter injury born after 34 weeks tend to have milder functional limitations later in life than those born earlier.
- There is a higher proportion of bilateral involvement in children born earlier.
- Spasticity is the most prevalent movement disorder for both groups.

A CASE STUDY COMPARING USUAL CARE EXERCISE AND BRAIN TRAINING EXERCISES IN THE MANAGEMENT OF KNEE OSTEOARTHRITIS

Harms AD1, Stanton TR1,2, Moseley LG1,2, Hau R1
1Northern Health, Melbourne
2The Sansom Institute for Health Research, The University of South Australia, Adelaide
3Neuroscience Research Australia, Sydney

Question: Do brain training exercises have a role in the management of osteoarthritic knee pain?

Design: Case study, recruited from a replicated case series study using a, randomised cross-over design comparing a usual care exercise programme (2 weeks) and brain training exercises (2 weeks) consisting of left/right judgements (pictures of left or right feet). Usual care was the first intervention. The participant was followed up at six months.

Participant: A 71 year old lady with a three year history of right knee pain (Kellgren Lawrence Scale Grade 3 knee osteoarthritis).

Outcome Measures: Knee pain rating with visual analogue scale, knee two point discrimination threshold, left/right judgement accuracy and speed, daily medication.

Results: Baseline, knee pain 46/100mm, paracetamol 3990mg, ibuprofen 800mg, two point discrimination threshold 97mm, Left/ right judgement accuracy right images 7% and left images 90% correct, reaction time 2.0 secs. Following two weeks of usual care, pain reported improvements in pain, two point discrimination and left/right judgement remained similar (78mm, 90% right, 90% left), although speed improved (1.5secs). At six month follow-up: pain remained at 0/100mm and no medication. Large decreases in two point discrimination occurred (52mm), Left/right judgement accuracy decreased (right 75%, left 83%) although speed improvements remained (1.6secs).

Conclusion: Brain training exercises may play a role in management of some presentations of osteoarthritic knee pain.

Key Practice Points:
- Central sensitisation, including disrupted cortical body schema, may contribute to osteoarthritis pain.
- Raised two point discrimination threshold and reduced left/right judgement accuracy indicate disrupted body schema.
- A brain training exercise programme may have a role to play in the management of some presentations of osteoarthritic knee pain.
CHILDREN WITH CEREBRAL PALSY: SERVICE UTILISATION AND PARENTAL SATISFACTION

Harvey A1,2,3, Scheinberg A1,2,3,4,5, Omar S1, Reid S1,2,6, Meehan, E1, Crompton K1, Reddihough D1,2,3
1Royal Children’s Hospital, Flemington Road, Parkville
2Royal Newcastle Centre, Newcastle
3University of Melbourne, Parkville
4Facility of Nursing and Medicine, Monash University
5Victorian Paediatric Rehabilitation Service

Questions: What is the service utilisation patterns of children with cerebral palsy at 5, 10 and 15 years of age? How satisfied are parents of these children with the frequency and quality of therapy received?

Design: Cross-sectional survey of medical, physiotherapy, occupational therapy and speech therapy services.

Participants: Parents of children with cerebral palsy across all gross motor function classification system levels. Of the 83 patients in the sample, 29 had a child aged 5 years, 27 had a child aged 10 years and 27 had a child aged 15 years.

Outcome Measures: A custom designed survey collecting information on: demographics, funding sources, medical services accessed, educational setting, therapy services utilised and satisfaction with services.

Results: Fifty three percent of surveys sent were returned. Forty-three percent of therapy accessed by children aged 5 years was funded by the Better Start Initiative, whereas 53% of therapy accessed by those aged 10 and 15 years was school-funded. Sixty percent of children accessed two or more hospital services in the previous 12 months. Frequency of therapy varied, however children attending special schools consistently received more therapy. Of those who received no therapy, 65% were ambulant. Seventy-five percent of parents were satisfied with the quality of therapy received, however satisfaction with frequency of service varied and was lowest among parents of 10 year old children. Parents provided valuable qualitative data on therapy provision.

Conclusion: Inconsistencies in service delivery for children with cerebral palsy within Victoria are influenced by funding available, school setting and gross motor function.

Key Practice Points:
- The Better Start Initiative is key for providing therapy services for young children with cerebral palsy
- Children in special schools have more access to therapy than those in mainstream schools
- Parental dissatisfaction with services is greatest at the primary school age

PHYSIOTHERAPISTS’ KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING CLINICAL PREDICTION RULES FOR LOW BACK PAIN

Haskins R, Osmotherly PG, Southgate E, Rivett DA
The University of Newcastle, Newcastle

Robin Haskins is a senior musculoskeletal physiotherapist at the Royal Newcastle Centre and is currently completing his PhD on the topic of low back pain clinical prediction rules. Mr Haskins is presently working within several research teams in the areas of osteoarthritis, spinal manipulation, spinal pain and probabilistic reasoning.

Question: What do physiotherapists know about clinical prediction rules for low back pain, what are their attitudes toward them, and what are their current practices regarding the use of these tools?

Design: Qualitative descriptive study using focus groups.

Participants: Twenty-six physiotherapists who manage patients with low back pain from across three geographic regions in NSW.

Results: Awareness and familiarity with low back pain clinical prediction rules was mixed with some clinicians not having previously encountered the term or concept. Clinical prediction rules were most often conceptualised as a formalisation of pattern recognition. A broad range of both facilitating and inhibiting attitudes toward the use of these tools were shared by participants. Factors influencing the adoption of these tools expressed by physiotherapists in this study include their complexity, interface, the use of the term ‘rule’, and their degree of accuracy and precision. Most believed that novice clinicians with limited experience may benefit the most from the use of clinical prediction rules. A limited number of physiotherapists expressed that they had previously used low back pain clinical prediction rules to inform their clinical decision making.

Conclusion: Understanding potential barriers, the needs of clinicians and the context in which clinical prediction rules will be implemented will help facilitate the development of tools with the highest potential to positively influence physiotherapy practice.

Key Practice Points:
- Clinical prediction rules for low back pain were not commonly used by physiotherapists in this study
- Knowledge about low back pain clinical prediction rules was highly variable
- Several identifiable factors are likely to influence the adoption of low back pain clinical prediction rules in clinical practice

PARENTS’ PERCEPTIONS OF THE HEALTH CARE NEEDS OF THEIR CHILDREN WITH CEREBRAL PALSY LIVING IN REGIONAL QUEENSLAND

Hayles E1,2, Jones A1, Harvey D1,4, Plummer, D1,5
1James Cook University, Townsville
2Queensland Health, Mackay
3James Cook University, Cairns
4Queensland Health, Cairns
5Queensland Health, Townsville

Question: How do parents’ of children with cerebral palsy living in a regional Queensland area experience health care for their child? How do these experiences contribute to parents’ understandings of the health care needs of their child? What do parents’ perceive to be important aspects of the health care needs of their children with cerebral palsy?

Design: Qualitative exploratory design using grounded theory methodology. Ethical approval granted by the Townsville Hospital Research and Ethics Committee.
Participants: Parents of children with cerebral palsy living in the Mackay region. Methodology: Participants were recruited using purposeful and theoretical sampling methods. Parents participated in semi-structured focus groups and interviews. Data collection and analysis was conducted concurrently following the method of constant comparative analysis. Interview transcripts are being analysed using initial coding and focused coding methods, information is being sorted into key categories, and relationships between key categories are being explored.

Results: Anticipating needs, ‘navigating the systems’, ‘overlooking needs’, ‘working together’, ‘individualising care’ and ‘finding a balance’ are emerging key aspects of the health care needs of children with cerebral palsy according to their parents and professionals. Relationships between key aspects will be described.

Conclusion: Understanding these key aspects will assist physiotherapists and physiotherapy services to deliver high quality health care services to children with cerebral palsy and their families living in a regional area, and contributes to the development of evidence based health care service delivery practices for this population.

Key Practice Points:
• Parents’ and professional health aspects have different perceptions of the health care needs of their children with cerebral palsy.
• The key aspects discovered in this research describe the health care needs of children with cerebral palsy according to their parents’ experiences and understandings.
• These key aspects of health care needs can be used in conjunction with our current medical and health professionals to improve the health care needs of children with cerebral palsy to deliver high quality services to this population.

WHAT PHYSIOTHERAPIST AND GENERAL PRACTITIONER REALLY WANT DURING INTER-PROFESSIONAL COMMUNICATION

Hayward KS, Willcock S
Sydney Medical Program, University of Sydney

Question: Physiotherapist and general practitioner communication: how do we improve this vital interaction?

Design: Qualitative study design incorporating semi-structured interviews. Subject number was determined by continued sampling until thematic saturation was reached.

Participants: Fourteen physiotherapists and general practitioners in metropolitan and regional practices.

Outcome Measures: Thematic coding analysis was used to code and report content exploration of electronic interview transcripts.

Results: Themes identified as important to physiotherapists included a desire to receive communication regarding a practical time frame for management, the reason for referral and information regarding the patient’s psychosocial history. The themes that emerged as important for general practitioners included a desire for feedback regarding the appropriateness of referral and information regarding the overall management plan. General practitioners also expressed a strong desire to be informed of the working diagnosis as well as a summary of treatment, time frames and long term goals.

Conclusion: There was consensus that to improve the interaction between general practitioners and physiotherapists written and verbal communication should be succinct, specific and appropriate. This is vital for optimal patient care. Routine communication should include diagnosis, time frames for management and long term goals.

Key Practice Points:
• Written communication encourages future referrals and is believed to be essential for optimal patient care.
• Routine communication with general practitioners should include diagnosis, time frames for management and long term goals.
• Physiotherapists would like appropriate information regarding psychosocial background and yellow flags.

CAN A CLINICALLY IMPORTANT IMPROVEMENT IN FUNCTION BE ACHIEVED DURING INPATIENT REHABILITATION BY STROKE SURVIVORS WITH SEVERE MOTOR DISABILITY?

Hayward KS1, Kyuys S2, Barker RN3, Brauer SG2
1The University of Queensland, Brisbane
2Griffith University, Gold Coast
3The Prince Charles Hospital, Brisbane

Question: Can stroke survivors with severe motor and upper limb disability demonstrate a functional improvement during inpatient rehabilitation? What proportion of those with severe disability achieve a minimal clinically important difference (MCID)?

Design: Prospective observational study.

Participants: 618 stroke survivors with a primary diagnosis of stroke receiving physiotherapy during inpatient rehabilitation in Queensland, Australia.

Outcome Measures: Measures were taken on admission and discharge from inpatient rehabilitation. To evaluate changes in functional motor ability the motor subscale of the Functional Independence Measure (motor-FIM) was performed. To evaluate changes in functional upper limb ability, Motor Assessment Scale item 6 upper arm function (MAS6) was performed.

Participants were grouped according to severity of disability.

Results: All participant groups (mild through to severe) improved during inpatient rehabilitation. Those with severe motor disability (motor-FIM score ≤ 40 on admission) achieved a significant improvement in functional motor ability (p < 0.001, mean change 32 of 91 points). This equated to 57% to 83% of participants achieving a MCID. Those with severe upper limb motor disability (MAS6 score ≤ 2 on admission) achieved a significant improvement in functional arm ability (p < 0.001, mean change 2 of 6 points), with 68% of participants achieving a MCID. Stroke survivors who were > 74 years and had severe disability also demonstrated a significant improvement in motor (m-FIM: p < 0.001) and upper limb function (MAS6: p < 0.001).

Conclusion: During inpatient rehabilitation a statistically significant and clinically meaningful improvements in function was achievable by stroke survivors who have severe motor disability.

Key Practice Points:
• Stroke survivors with severe disability demonstrate clinically meaningful functional improvements during inpatient rehabilitation.
• This suggests that severity of disability alone should not preclude admission to inpatient rehabilitation.
• Future studies should determine what facilitates these changes in function and how implement this during rehabilitation.

EVIDENCE FOR USING RESUSCITATION BAGS TO MANUALLY HYPERINFLATE CHILDREN WITH CEREBRAL PALSY OR NEUROMOTOR DISORDERS TO SUPPORT EFFECTIVE COUGHING

Hazlitt CA
Paediatric Physiotherapy, Tasmanian Health Organisation – North West

Question: What is the evidence for the use of resuscitation bags to provide manual hyperinflation to support effective coughing in children with Cerebral Palsy and other neuromotor disorders.

Participants: Children with Cerebral Palsy or other neuromotor disorders.

Intervention: Manual hyperinflation provided by resuscitation bag valve mask systems.

Outcome Measures: Cough effectiveness, hospitalisations or number of chest infections.

Results: The review found little evidence regarding the use of manual hyperinflation provided by resuscitation bags. Evidence was Level B and C with few experimental studies.
 tavern: Best available evidence for the use of resuscitation bags to provide manual hyperinflation to children with Cerebral Palsy and other neuromotor disorders is currently based on extrapolation from physiological data, expert opinion and a small number of experimental studies. Use of this treatment technique would benefit from additional high quality research into its safety and effectiveness.

**Key Practice Points:**
- Best available evidence for this intervention is limited to Level B and C.
- Research evidence in this field is limited to mainly descriptive and opinion pieces with a small number of poorer quality experimental studies.
- Use of this intervention should be undertaken cautiously and closely monitored.

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**TELEHEALTH READINESS FACTORS IN PARENTS ON KING ISLAND THAT MAY AFFECT DEVELOPMENT OF A PAEDIATRIC PHYSIOTHERAPY DROP IN CLINIC**

Hazlitt CA
Paediatric Physiotherapy, Tasmanian Health Organisation – North West

**Questions:** What are the telehealth readiness factors in parents of children aged 0–8 resident on King Island that may affect the successful development and implementation of a telehealth based Paediatric Physiotherapy Drop in Clinic.

**Design:** A mixed methods approach based in a pragmatic paradigm.

**Participants:** Seven parent and three key stakeholder respondents.

**Outcome Measures:** Readiness factors for telehealth were elicited by parent questionnaire and stakeholder interview. Data analysis consisted of simple descriptive statistics counts for quantitative responses and thematic analysis of qualitative responses.

**Results:** Parents were reported by both groups to demonstrate core and engagement readiness for telehealth. Structural readiness was identified by stakeholders but not parents as being present. Qualitative and quantitative results differed in regards to concerns about privacy and the “replacement” of face to face services. Additionally, both stakeholders and parents indicated that the perception of physiotherapy as a “hands on” profession would act as a barrier to telehealth services.

**Conclusion:** Stakeholders and parents indicated that core and engagement readiness were present to support the development of a clinic. Factors likely to impact on service development are structural readiness and management of concerns regarding privacy and potential loss of services. The identification of the perception of physiotherapy as a manual profession impacting on telehealth engagement in stakeholders and parents is a new finding.

**Key Practice Points:**
- Adoption of a mixed methods approach highlighted inconsistencies in responses gained regarding key factors that may impact on successful service development
- Factors likely to have greatest impact on service development may impact on successful service development
- Use of this intervention should be undertaken cautiously and closely monitored.

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**WRIST AND FINGER EXTERNAL MUSCLE ACTIVITY DURING RESISTED MIDDLE AND INDEX FINGER EXTENSION IN NON-SYMPOMATIC PEOPLE: A REPEATED MEASURES LABORATORY STUDY**

MacDonald DA1, Heales LH1-2, Barnard N1, Cox D1, Gilga A1, Kalyanasundaram S1, Mascali N1, Thompson M1, Vicenzino B1-2
1The University of Queensland, Human Neuroscience Unit, Division of Physiotherapy, School of Health & Rehabilitation Science
2The University of Queensland, Sports Injury, Rehabilitation and Prevention for Health Research Unit, Division of Physiotherapy, School of Health & Rehabilitation Science

**Question:** Are extensor carpi radialis longus (ECRL), brevis (ECRB) and extensor digitorum communis (EDC) differentially activated during resisted middle and index finger extension: consistent with techniques used to clinically identify lateral epicondylalgia?

**Design:** Repeated measures experiment.

**Participants:** Ten healthy adults without neck or upper limb symptoms (mean ±SD: age 33 ±13 years, 3 female).

**Intervention:** Intramuscular electromyography recorded ECRL, ECRB, and EDC activity during a standardised isometric middle and index finger extension in three limb positions (elbow extended/ flexed–forearm pronated; elbow flexed–forearm neutral). Force was standardised to 75% of the maximum force generated during resisted index and middle finger extension.

**Outcome Measures:** Normalised root mean square ECRB, ECRB and EDC electromyographic activity. A repeated measures analysis of variance compared electromyographic activity between ECRL, ECRB and EDC in each limb position during resisted index and middle finger extension.

**Results:** There were no significant differences in ECRB and ECRB electromyographic activity between resisted middle and index finger extension or limb positions. Regardless of limb position, EDC was 1.7 times more active than ECRB (p = 0.04) and 3.6 times more active than ECRB (p < 0.001) during resisted finger extension.

**Conclusion:** In healthy adults without upper limb symptoms, the application of resistance to index or middle finger (consistent with a commonly used test in lateral epicondylalgia) differentially activates EDC from ECRB and ECRB (EDC differently activated). A difference in electromyographic activity between ECRB and ECRB. This research forms a basis upon which to study such activity in people with pathology.

**Key Practice Points:**
- EDC activity was greater than ECRL and ECRB activity in all conditions.
- Regardless of limb position and application of resistance there was no difference between ECRB and ECRB activity in healthy controls.
- Further investigations are required to determine the pattern of muscle activity in people with pathology.

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**DIAGNOSTIC UTILITY OF ULTRASOUND IMAGING IN PEOPLE WITH LATERAL EPICONDYLALGIA: A CASE CONTROL STUDY**

Heales LH1, Broadhurst N1, Mellor R1, Hodges P2, Vicenzino B1-2
1The University of Queensland, Human Neuroscience Unit, Division of Physiotherapy, School of Health & Rehabilitation Science
2The University of Queensland, NMHCRC Centre of Clinical Research Excellence in Spinal Pain, Injury and Health, School of Health and Rehabilitation Science

**Question:** What is the diagnostic utility of ultrasound imaging in lateral epicondylalgia?

**Design:** Case-control study with assessor blinding.

**Participants:** We recruited 29 participants with lateral epicondylalgia (mean age ±SD: 49 years ±8, 12 female) and 21 age, gender and hand dominance matched controls (52 years ±9, 12 female).
**Intervention:** The reference standard was a physiotherapist determined clinical diagnosis of lateral epicondylalgia. Lateral epicondylalgia was defined as pain over the lateral epicondyle, which was provoked by palpation, resisted wrist and/or middle finger extension and gripping. Participants with neck or other upper limb pain were excluded. Ultrasound investigations were performed by sonographers at CitScan Radiology (Brisbane, Australia) and reported by a radiologist. The sonographers and radiologist were blind to the participant's condition. Transverse and longitudinal images were assessed using a Philips IU22 machine, with a linear transducer (frequency range: 1.7-5MHz).

**Outcome Measures:** Greyscale images were assessed and rated on a four-point ordinal scale for tendon thickening, echogenicity, fibrillar disruption, and calcification. Power Doppler was used to identify neovascularity, which was rated on a five-point ordinal scale.

**Results:** Clinical examination identified 29 affected and 48 unaffected arms. Diagnostic ultrasound had a sensitivity of 90% (95% confidence interval [CI] 74% to 96%), and specificity of 61% (95% CI 45% to 71%), with a positive likelihood ratio of 2.18 (95% CI 1.60 to 2.97) and a negative likelihood ratio of 0.18 (95% CI 0.06 to 0.52).

**Conclusion:** Diagnostic ultrasound, when negative for tendinopathic changes confirms the absence of lateral epicondylalgia.

**Key Practice Points:**
- The clinically recognised condition of lateral epicondylalgia is not associated with ultrasound determined tendinopathy.
- A negative ultrasound scan results in a 6.2% post test probability of lateral epicondylalgia, from 27% pre test probability
- The validity of non-invasive ultrasound imaging in determining tendon pathology requires further study.

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**AN AI CHI BASED AQUATIC GROUP IMPROVES BALANCE AND REDUCES FALLS IN COMMUNITY DWELLING ADULTS: AN OBSERVATIONAL COHORT STUDY**

Hewitt M1, Dinh T2, Thwaites C1, Skinner EHL1,2,3

1 Western Health
2 The University of Melbourne
3 Monash University

**Questions:** Does an aquatic group based on Ai Chi principles (Aquabalance) improve balance and reduce the number and risk of falls? Will Aquabalance be acceptable to patients?

**Design:** Prospective observational cohort study.

**Participants:** Thirty outpatients referred to physiotherapy for falls and balance related conditions.

**Intervention:** 45 minute weekly group aquatic session, for eight weeks, covering 18 Ai Chi postures.

**Outcome Measures:** Balance measures included the ‘Timed Up and Go’ (TUG), Four Square Step (4SST) and unilateral Step Tests. Patients self-report of number of falls, attendance and satisfaction were recorded.

**Results:** 30 patients completed the program. The TUG improved by a median of 2.4 sec (95% CI -4.2 to -1.5, p < 0.001); 4SST improved by 5.0 sec (95% CI -8.1 to -2.5, p < 0.001); right and left step tests by a mean of 3.3 steps (95% CI -4.2 to -2.3, p < 0.001) and 2.8 steps (95% CI 1.60 to 2.97) respectively. Thirty-seven percent of participants were at high falls risk before Aquabalance, averaging 0.22 falls per person per month in the six months prior and 23.3% remained at high falls risk upon completion, averaging 0.03 falls per person per month during the intervention period. Participants completed a mean (SD) of 7.5 (0.9) out of 8 sessions and 93% were satisfied.

**Conclusion:** Patients who completed Aquabalance improved their balance and had a reduction in number of falls. The program was well attended and acceptable to participants. A randomised controlled assessor-blinded trial is required.

**Key Practice Points:**
- An aquatic group program based on Ai Chi principles improved balance and reduced falls in this cohort
- Aquatic programs can be well attended and enjoyed by patients with falls or balance impairment
- Further high quality research comparing aquatic versus land based falls and balance programs is warranted

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**AQUATIC PHYSIOTHERAPY PROFESSIONAL DEVELOPMENT: MODIFYING CORE CONCEPTS TO NEW EDUCATION INTERFACES, EVOLVING CLINICAL PRIORITIES AND IMPROVING RISK MANAGEMENT AWARENESS**

Heywood SE1,2, Daly AE1

1 Aquatic Physio Exercise Australia, Melbourne
2 The Melbourne Sports Medicine Centre, Melbourne

**Introduction:** Contemporary aquatic physiotherapy must meet the challenges of today’s health care environment. The recent revolution in post-graduate aquatic physiotherapy education prioritises chronic disease and exercise, incorporating new evidence, expanding risk management in practice and exploring opportunities in eLearning.

**Discussion:** Key concepts of hydrostatics and hydrodynamics along with the physiology of immersion have underpinned safe and effective use of water as a medium for rehabilitation for many years. Recent investigations of load and movement have led to a greater understanding of not only vertical forces but also horizontal forces and rotational planes of movement in water. The aquatic environment continues to be an enabler for exercise, including cardiovascular training, for people with chronic disease. Outcome measures in impairments and activity limitations are critical alongside participation restrictions when independent movement or swimming may be a goal. Education in physiology includes the emerging areas of the sympathetic nervous system and cardiopulmonary rehabilitation. Managing people with multiple comorbidities needs comprehensive screening tools alongside risk management of infection control and falls risks. The digital age presents opportunities for self-paced interactive eLearning packages in the key areas of applied physics, physiology, clinical reasoning, evidence-based practice and pool management.

Despite not having a practical component, these courses still focus on developing clinical practice. ELearning is a convenient platform for delivering post-graduate education to rural and remote physiotherapists as well as those looking to extend their knowledge base beyond foundation courses.

**Conclusion:** Aquatic physiotherapy post-graduate education in Australia has an updated focus and improved access.

**Key Practice Points:**
- Maintaining a focus on physics, physiology and clinical reasoning is important in post-graduate aquatic physiotherapy education
- Evidence-based practice in chronic disease remains a high priority
- Aquatic physiotherapy post-graduate education in Australia has embraced eLearning for greater access and choice with professional development

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**PREDICTING FOOTBALL INJURIES USING A RATIO OF LUMBO-PELVIC MUSCLE SIZES**

Hides JA, Stanton WR

School of Physiotherapy, Faculty of Health Sciences, Australian Catholic University (McCauley Campus), Brisbane

**Question:** Can a ratio of trunk muscles be used to predict injuries in elite AFL players?

**Design:** Quasi experimental study.

**Participants:** Sixty-four (64 M) healthy elite AFL players.

**Intervention:** Players perform approximately 16 weeks of full-time pre-season training prior to the AFL playing season. Club injury reports were used to determine the prevalence of injuries sustained during pre-season training.

**Outcome Measures:** Cross-sectional areas (CSAs) of the multifidus and quadratus lumborum muscles were measured at the start of the pre-season using ultrasound imaging.
Funding for evidenced based treatments will mean that physiotherapists are challenged with providing best practice. Aged Care Funding Instrument only funds treatments with research support. Addressing this we can better enhance the well being of residents and potentially reduce the costs of providing care. This information could be used to develop pre-season screening programs for AFL players.

**Key Practice Points:**
- Measurements of muscle size taken at the start of a pre-season can be used to predict injury
- A ratio of two muscles was more accurate in predicting injury than individual measurements
- This information could be used to develop pre-season screening programs for AFL players

**Hill A**

HammondCare

The Aged Care Funding Instrument is used to determine the level of payments for residents in aged care facilities. According to this instrument, facilities can claim when physiotherapists apply heat packs, massage and electrotherapy modalities to a resident with complex pain. All these treatments are passive and have limited supporting evidence. Treatments such as exercise and functional practice are not claimable despite having strong evidence for chronic pain management and additional health benefits. In this case study we focus on a gentleman with chronic pain in his hand. Our approach is to help him manage his pain through encouraging functional use of the hand and exercise. Despite having supporting evidence these treatments are not claimable. Ideally we would treat all residents according to best practice but we need to consider the financial justification for physiotherapy otherwise we risk losing our role in residential care all together. In some care facilities physiotherapists feel pressure to preferentially provide claimable treatments at the expense of more evidenced based practices. Through this discussion we will explore the changes that need to occur so that the ACFI supports physiotherapists to deliver services that are most beneficial to residents and reflect the principles under which we practice. With our skills properly recognised by the ACFI we can better illustrate our value in other areas such as falls prevention and manual handling. By doing this we better enhance the well being of residents and potentially reduce the costs of providing care.

**Key Practice Points**
- Aged Care Funding Instrument only funds treatments with questionable evidence for chronic pain
- Physiotherapists are challenged with providing best practice whilst keeping their role financially justifiable.
- Funding for evidenced based treatments will mean that physiotherapists can better serve residents and potentially reduce costs in residential care.

**Does the Aged Care Funding Instrument (ACFI) Lead Physiotherapy Away from Evidenced Based Practice?**

**Hill A**

HammondCare

**TAILORED EDUCATION FOR OLDER PATIENTS TO FACILITATE ENGAGEMENT IN FALLS PREVENTION STRATEGIES AFTER HOSPITAL DISCHARGE: A PILOT RANDOMIZED CONTROLLED TRIAL**

**Hill AM1**, Etherton-Beer C2, Haines TP1,4

1The University of Notre Dame Australia, School of Physiotherapy, Institute for Health Research, Fremantle
2The University of Western Australia, School of Medicine and Pharmacology, Western Australian Centre for Health and Ageing, Perth
3Monash University, School of Primary Health Care, Cheltenham
4Southern Health, Allied Health Research Unit, Clayton

**Question:** What is the effect of providing tailored falls prevention education in hospital on patients? i) engagement in targeted falls prevention behaviors in the month after discharge: ii) self-perceived risk and knowledge about falls and falls prevention strategies?

**Design:** A two-group, pilot randomized controlled trial (n=50), concealed allocation, assessments conducted by blinded researchers, intention-to-treat analysis.

**Participants:** Hospital inpatients 60 years or older, discharged to the community.

**Intervention:** A tailored education package consisting of multimedia falls prevention information with trained physiotherapist follow-up, delivered in addition to usual care.

**Outcome Measures:** Engagement in falls prevention behaviours in the month after discharge measured with a structured survey; participants’ knowledge, confidence and motivation levels surveyed before and after receiving the education. Falls outcomes (falls, fall-related injuries) were also collected.

**Results:** Participants in the intervention group were significantly more likely to plan how to safely restart functional activities [Adjusted odds ratio 3.80, (95% CI 1.07 to 13.52), p=0.04] and more likely to complete other targeted behaviours such as their own home exercise program [Adjusted odds ratio 2.76, (95% CI 0.72 to 10.50), p=0.14] than the control group. The intervention group was significantly more knowledgeable, confident and motivated to engage in falls prevention strategies after receiving the education than the control group. There were 23 falls (n=5 intervention; n=18 control). Falls rates were 5.4/1000 patient days (intervention); 18.7/1000 patient days (control).

**Conclusion:** This tailored education was received positively by older people and resulted in increased engagement in falls prevention strategies after hospital discharge.

**Trial registration:** ACTRN12611000963921.

**Key Practice Points:**
- Tailored education increases engagement by older people in falls prevention strategies after hospital discharge.
- Older people are more knowledgeable, confident and motivated to engage in falls prevention strategies after receiving tailored education.
- Future research should evaluate the effect of education on preventing falls among older people after hospital discharge.

**AN EXAMINATION OF THE PATIENT-PHYSIOTHERAPIST INTERACTION IN PRIVATE PRACTICE**

**Terry AJM1, Delany CM2, Guillemin M3**

1Department of Physiotherapy, Melbourne School of Health Sciences and Centre for Health and Society, Melbourne School of Population and Global Health, The University of Melbourne
2Department of Physiotherapy, Melbourne School of Health Sciences, The University of Melbourne
3Centre for Health and Society, Melbourne School of Population and Global Health, The University of Melbourne

**Question:** What is the effect of providing targeted falls prevention education in hospital on patients? i) engagement in targeted falls prevention behaviors in the month after discharge: ii) self-perceived risk and knowledge about falls and falls prevention strategies?

**Design:** Qualitative methodology, incorporating aspects of ethnography and grounded theory.

**Key Practice Points:**
- Tailored education increases engagement by older people in falls prevention strategies after hospital discharge.
- Older people are more knowledgeable, confident and motivated to engage in falls prevention strategies after receiving tailored education.
- Future research should evaluate the effect of education on preventing falls among older people after hospital discharge.
**Intratester Reliability of Diagnostic Ultrasound Assessment of the Wrist and Phalanges to Determine Skeletal Maturity**

Farrow M, Hing WA, Steele M  
Bond University, Gold Coast

**Question:** To establish the reliability of ultrasound (US) imaging of the wrist and phalanges. To investigate whether epiphysial height measurements were correlated to the chronological age of subject.

**Design:** Within and between session intratester reliability study.

**Participants:** 22 participants aged between 6–22 years were assessed.

**Intervention:** US examinations of the wrist and hand (3 measurements) were performed using a GE Vivid-I portable US machine (with 10 MHz linear array transducer) within two sessions. Images were obtained from both the sagittal and transverse planes.

**Outcome Measures:** The reliability of measurements within each session were analysed using Cronbach’s alpha coefficients. The average epiphysial height measurements were compared between sessions using a paired T-test (95% CI).

**Results:** In total 44 MCP2 and 3 joints and 31 distal radius were imaged. There was excellent within session reliability of measurement for all joints in both measurement sessions MCP2 (r = 0.98, p < 0.000), MCP3 (0.99, 0.82) and radius (0.87, 0.92). There was no significant difference between session 1 and 2 for MCP2 (p = 0.638), MCP3 (p = 0.316) and radius (p = 0.916). With respect to epiphysial height measurements, all measurements recorded were significantly correlated to the age of the subject. A positive correlation was observed from measurements of the distal Radial epiphysis in session one from pooled data.

**Conclusion:** Results indicate that epiphysial height of the distal radius is positively correlated with the chronological age of the subject. Although the use of US to assess skeletal maturity is yet to be analysed thoroughly, current evidence suggests it could be a valid alternative to conventional radiography. Advantages of US include, easily accessible, low cost, quick scan time, the ability to perform real time imaging, can be used as a mobile unit and most importantly prevents exposing the patient to any damaging radiation.

**Key Practice Points:**
- To establish the reliability of imaging growth plates in the fingers and wrist
- To determine whether this form of imaging grows plates with ultrasound has value and accuracy when compared to conventional x-ray methods.

**Injury Prediction Screening in Young Golfers: A Convergent Validity Pilot Study**

Carney M, Hing W, Meyer J

**Question:** Is there convergent validity amongst two currently used functional movement pre-screening tests (FMS™ and Golf Australia golf specific pre-screening test).

**Design:** Convergent validity design through statistical and observational analysis.

**Participants:** Twenty (n = 3 female, n = 17 male) healthy actively participating elite and sub-elite young golfers (age M = 16.05 ± 3.10).

**Outcome Measures:** Functional Movement Screen™ and Golf Australia golf specific pre-screening test (GA) total scores and between test scores.

**Results:** FMS™ and GA specific test total scores showed significant positive correlation both statistically and observationally (r (20) = .696, p < .001). Item pairing intercorrelation of the FMS™ In-line Lunge (IL) significantly correlated with GA Pelvic Control (PC) (r (20) = .643, p < .002). Single Leg Squat (SLS) left (r (20) = .777, p < .000), and right, (r (20) = .703, p < .001), and Deep Overhead Squat (DOS) (r (20) = .715, p < .000). These results were supported with observational data. The FMS™ Active Straight Leg Raise (ASLR) was also found to have a significant positive correlation with GA PC (r (20) = .773, p < .000), the SLS, left (r (20) = .727, p < .000) and right (r (20) = .678, p < .001), and DOS (r (20) = .745, p < .000).

**Key Practice Points:**
- To establish the reliability of imaging growth plates in the fingers and wrist
- To determine whether this form of imaging grows plates with ultrasound has value and accuracy when compared to conventional x-ray methods.
Conclusion: The results provide support for preliminary convergent validity of the total scores; however, closer investigation suggests that the FMS™ and the GA golf specific screening test show limited convergent validity of the items pairing intercorrelation assessment of injury risk in young golfers.

Key Practice Points:
• There is no gold standard test for functional movement pre-screening for injury within a younger population.
• There have been no comparisons made between the Functional Movement Screen™ and a sports specific pre-screening test.
• Further high quality research with attainment of standardised data in this population group is needed.

DRY NEEDLING AS A TREATMENT FOR LATERAL EPICONDYLALGIA

O’Sullivan D, McCutcheon L, Hing W
Bond University

Question: Is dry needling an effective treatment for Lateral epicondylalgia (LE)?

Design: Single case study.

Participant: 53 year old female with symptoms on lateral side of right elbow longer than 3 months. Physical examination revealed the classical signs of LE.

Intervention: Dry needling and acupuncture techniques were applied to the extensor carpi radialis brevis (ECRB) enthesis and tendon body in order to investigate the effect of dry needling on the pain and dysfunction that characterizes LE. The patient received four treatments with pre-assessment over four weeks and a follow-up assessment three weeks post-intervention.

Outcome Measures: A visual analogue scale (VAS) and pressure algometer were used to measure pain. Function was measured with grip dynamometer and two function questionnaires, the QuickDASH and Patient Rated Tennis Elbow Evaluation (PRTEE).

Results: A reduction in pain and increase function and grip strength was found over the period of intervention. The rate of pain reduction was greater than that for improvement in function. Grip strength in the effected arm increased 1000% on the final treatment and this was maintained at follow-up. All subjective measures (PRTEE, QuickDASH and VAS) also demonstrated improvements in both pain and function as reported by the patient, with pain at rest eliminated at follow up. Algometry measures also demonstrated improvements in pain pressure threshold (PPT) at both the ECRB enthesis and body, improving 19% and 12.5% respectively.

Conclusion: Although the single case study design limits generalisation of the results, it provides evidence of the beneficial response obtained by the use of this technique in patients affected by LE including restoration of function and induction of a hypoalgesic effect.

Key Points:
• Dry needling is more likely to be effective as a treatment for the symptoms of lateral epicondylalgia
• Further high quality evidence is needed investigating dry needling as a lone treatment for lateral epicondylalgia.

INTRA- AND INTERRATER RELIABILITY OF ALLIED HEALTH PROFESSIONALS USING THE ANTERIOR LINE METHOD TO ASSESS SUBTALAR NEUTRAL

MacFarlane C, Hing W
Bond University, Gold Coast

Question: To establish intrarater and interrater reliability of the measurements of the Anterior Line Method (ALM), which assesses subtalar joint neutral (STJN) in the foot.

Design: Within session intrarater and interrater reliability study.

Participants: There were 6 assessors from different professions (Podiatrist, Physiotherapist, Osteopath, Chiropractor) who measured the left and right feet of 21 subjects (6 children and 15 adult).

Intervention: The ALM of measurement was carried out twice the Resting Calcaneal Stance Position (RCSP) and the Neutral Calcaneal Stance Position (NCSP) by all 6 assessors over the subsequent days off rehearsal and performance.

Outcome Measures: RCSP and NCSP were recorded and Intra- and interrater reliability was assessed by calculation of an F statistic (analysis of variance), the intraclass correlation coefficient (ICC, 95% CI) and the standard error of measurement.

Results: The intrarater reliability for RCSP for all subjects ranged from moderate (0.51; 95% CI: 0.11 to 0.77) to excellent (0.96; 95% CI: 0.93 to 0.98) and for NCSP from poor (0.30; 95% CI: 0.12 to 0.64) to excellent (0.86; 95% CI: 0.75 to 0.92).

On the basis of the average of the two measures, intrarater agreement varied amongst assessors (p = 0.011). Post Hoc analyses identified excellent reliability between three of the assessors (1-3), and poor reliability for both RCSP (p < 0.000) and NCSP (p = 0.000) when assessors 1-3 were compared with assessors 4. The intra- and interrater reliability of measurement of both RCSP and NCSP was higher when measuring adult subjects compared to that of children.

Conclusion: The RCSP is more reliable to measure than the NCSP. It is apparent that the level of experience in using the ALM, and the profession of an assessor, influence the reliability of measure. Finally the ALM is more reliable when measuring adult subjects when compared to children.

Key Practice Points:
• To establish the reliability of the ALM within allied health practitioners, thus confirming the use of this measure in the clinical practice setting
• To determine how experience in use of this technique influences the reliability of the measure
• Is this technique a reliable measurement tool for both a children and adult population

NUTRITIONAL INTAKE AND HYDRATION AMONG THE HUMAN CIRCUS ARTS: COMPARING PRACTICE TO CURRENT TRENDS IN AN ELITE ENTERTAINMENT PRODUCTION

Bond A1, Powell J2, Hing W2
1Bond University, Australia
2Las Vegas, Nevada

Questions: Is there currently any nutrition and hydration screening in the human circus industry? Is there evidence to suggest that nutrition and hydration screening is required? What are/is there any nutrition and hydration interventions being used in the human circus industry? What are the greatest concerns for coaches regarding their artists’ nutrition and hydration consumption? Would screening and intervention reduce injury and subsequent days off rehearsal and performance?

Design: Cohort Study.

Participants: Seven performance medicine staff and coaches from an acrobatic entertainment company.

Methods: An audit performed by questionnaire. Consent and ethics approval was obtained. It incorporated a series of multiple choice and open-ended questions to obtain information, perception and current recommendations for nutrition, hydration, supplementation and recovery.

Results: 57% use weight and height measures to screen their artists on initial contracts and 14% use these measures on return from illness, injury or leave. 57% give nutrition and/or fluid recommendations to their artists. No respondents perform any screening to monitor recovery. 57% provide recommendations regarding recovery. All respondents indicated concern for their artists in regards to nutrition and hydration consumption and they believed formal screening and nutrition/hydration guidelines would be beneficial.

Conclusion: This is the first study to investigate nutrition and hydration screening/intervention in the human circus industry. Results showed minimal screening and intervention is being performed. It supports the need for further investigation in the human circus and performance industry to provide the basis for developing a nutrition and hydration screening assessment and intervention.

Key Points:
• There is a need for formal nutrition and hydration screening and intervention to enhance performance and optimize recovery.
• It may be assumed that with this, physical and psychological screening may be beneficial to assist in reducing injury and ensuring mental recovery.
• Physiotherapists can play an important role in devising such screening tools and interventions.

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• It may be assumed that with this, physical and psychological screening may be beneficial to assist in reducing injury and ensuring mental recovery.
• Physiotherapists can play an important role in devising such screening tools and interventions.
THE EFFECT OF MULLIGAN’S BENT LEG RAISE

Nijskens S, Hing WA, Steele M
Bond University, Gold Coast

Question: What is the immediate and long term effect of Mulligan’s Bent leg raise (BLR), with or without a home stretch, on knee extension angle (KEA) and straight leg raise (SLR) and when compared with a static hamstring stretch.

Design: Randomised control trial

Participants: 60 healthy individuals aged 18–65

Intervention: Group 1 (control) with no intervention. Group 2, a static stretch intervention group, performing a hamstring stretch once held for 30 seconds. Group 3 was a BLR, and Group 4, a BLR with a home BLR stretch.

Outcome Measures: The outcome measures were KEA and SLR. Measurements were taken before and after the interventions and then follow up after 1 week.

Results: For both KEA and SLR, the control group had no change whereas all the 3 intervention groups had a significant improvement (p < 0.05). Group 2 (KEA -5.37° SLR 4.21°; p = 0.001), Group 3 (KEA -5.82° SLR 6.84°; p = 0.001), and Group 4 (KEA -7.5° SLR 6.61°; p = 0.000) demonstrating that all interventions were effective. No statistically significant difference across all groups were found post intervention to 1 week later, indicating that the intervention improvements were maintained (p > 0.05). Furthermore, baseline compared to 1 week later, for both KEA and SLR were significant throughout the three intervention groups (p < 0.05), indicating results did not return to baseline.

Conclusion: Both static stretch and BLR improve KEA and SLR. BLR has a greater effect on SLR range of motion when compared to static stretch techniques. A home BLR stretch does not appear to be required to maintain/improve the initial gain of a BLR intervention.

Key Practice Points:
• Bent straight leg raise may be a useful technique for increasing hip range of motion and hamstring length.
• Bent straight leg raise has more effect than static stretching

MUSCULOSKELETAL PAIN IS COMMON AMONGST ELITE FOOTBALL MATCH OFFICIALS, BUT DECREASES ACROSS THE FOOTBALL SEASON: AN OBSERVATIONAL STUDY

Corey LAS, Hirschhorn AD3, Mungovan SF3, Breckenridge JD3
1Central West Orthopaedic and Sports Physiotherapy, Sydney
2Westmead Private Physiotherapy Services, Sydney
3The Clinical Research Institute, Sydney

Questions: How prevalent is musculoskeletal pain amongst elite football (soccer) match officials? Does prevalence change over the course of the football season? Are there differences between referees and assistant referees (linemenpersons)?

Design: Prospective study using self-report pain surveys.

Participants: Forty-five match officials contracted to Hyundai A-League men’s and Westfield W-League women’s national football competitions.

Outcome Measures: Match officials completed surveys on three occasions: pre-season, mid-season and end-season. Presence and severity of musculoskeletal pain across eleven anatomical sites in four body regions: spinal, hip, knee and foot/ankle, were assessed using 0–10 Likert scales. Scores ≥ 4/10 were considered positive for (moderate or greater) pain.

Results: Pre-season, 40/45 match officials (89%) reported pain at ≥ one site. End-season, 32/45 match officials (71%) reported pain at ≥ one site (p = 0.063 vs pre-season). There was a significant reduction in the mean number of painful sites across the football season (pre-season: 3.6 ± 2.8 sites vs end-season: 2.1 ± 2.1 sites, p = 0.004). There were significant reductions in the prevalence of hip (p = 0.017), knee (p = 0.010) and ankle (p = 0.017), but no spinal pain (p = 1.00) from pre- to end-season. A significantly higher proportion of assistant referees than referees reported end-season knee pain (p = 0.008).

Conclusions: Musculoskeletal pain is common in elite football match officials, but decreases across the football season. Pain presentation differs between referees and assistant referees. Research into training and injury prevention programs for elite football match officials is warranted.

Key Practice Points:
• The majority of elite football match officials have musculoskeletal pain.
• Further research is required to determine the mechanisms of this musculoskeletal pain.
• As with athletes, match officials may benefit from formalized training and injury-prevention programs.

PHYSICAL ACTIVITY IN THE INPATIENT PERIOD AFTER CARDIAC SURGERY: AN OBSERVATIONAL STUDY

Mungovan SF1, Singh P3, Hirschhorn AD1,2
1The Clinical Research Institute, Sydney
2Westmead Private Physiotherapy Services, Sydney
3Westmead Private Physiotherapy Services, Sydney

Questions: How much physical activity is performed in the first five days after cardiac surgery? How much of the physical activity is physiotherapy-supervised, and how much is independent? Is there a relationship between physical activity levels and functional capacity on postoperative day six?

Design: Prospective observational study.

Participants: Eighty-three patients without musculoskeletal and/or neurological impairment, who had undergone coronary artery and/or cardiac valve surgery via median sternotomy. Participants performed a twice-daily program of physiotherapy-supervised walking as permitted by clinical status.

Outcome Measures: Physical activity levels: i) step count; and ii) duration (time) of physical activity ≥ 3 METs, were measured daily and overall from postoperative day one to five using the SenseWear Pro Armband. Functional capacity was measured on postoperative day six with a six-minute walk test (6MWT).

Results: Physical activity levels increased significantly with each postoperative day (p < 0.001) to a peak of 2547 ± 2336 steps and 22 ± 24 min on postoperative day five. 52 ± 20% of overall step count and 57 ± 29% of overall time ≥ 3 METs was physiotherapy-supervised (mean duration of supervision: 189 ± 35 min over five days). There was a significant correlation between overall supervised and independent step counts (r = 0.718, p < 0.001), and overall step count and 6MWT distance (r = 0.779, p < 0.001).

Conclusions: The majority of physical activity after cardiac surgery is performed under physiotherapy-supervision. Increased physical activity, both supervised and independent, is related to improved functional capacity.

Key Practice Points:
• Physical activity is limited early after cardiac surgery.
• A majority of physical activity is performed under physiotherapy-supervision.
• Increased physical activity is related to improved functional capacity.

A MULTICOMPONENT THEORY-BASED INTERVENTION IMPROVES UPTAKE OF PELVIC FLOOR MUSCLE TRAINING BEFORE RADICAL PROSTATECTOMY

Hirschhorn AD1, Kolt GS, Brooks AJ3
1School of Science and Health, University of Western Sydney, Sydney
2Westmead Private Physiotherapy Services, Sydney
3Western Urology, Sydney

Questions: What is the effect of a multicomponent theory-based intervention, on provision/receipt of preoperative pelvic floor muscle training (pre-PFMT) among men having radical prostatectomy.

Design: Before and after cohort study.

Participants: Men having radical prostatectomy over an 18-month period (nine months pre-intervention, nine months post-intervention) at one public hospital (n = 30) and two private hospitals (n = 94) in Western Sydney.

Results: Physical activity levels increased significantly with each postoperative day (p < 0.001) to a peak of 2547 ± 2336 steps and 22 ± 24 min on postoperative day five. 52 ± 20% of overall step count and 57 ± 29% of overall time ≥ 3 METs was physiotherapy-supervised (mean duration of supervision: 189 ± 35 min over five days). There was a significant correlation between overall supervised and independent step counts (r = 0.718, p < 0.001), and overall step count and 6MWT distance (r = 0.779, p < 0.001).

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Key Practice Points:
• Physical activity is limited early after cardiac surgery.
• A majority of physical activity is performed under physiotherapy-supervision.
• Increased physical activity is related to improved functional capacity.
Intervention: A multicomponent intervention incorporating patient information guides, an evidence summary, audit and feedback and a provider directory.

Outcome Measures: Provision/receipt of pre-PFMT was assessed through: (i) surveys of men having radical prostatectomy; and (ii) audits of local public sector (n = 4) and private sector (n = 2) providers of PFMT. Urinary incontinence was assessed using the ICIQ-UI Short Form at 3 months after radical prostatectomy.

Results: There was a significant increase in the proportion of survey respondents receiving pre-PFMT post-intervention (post-Intervention: 42/58 respondents, 72% vs pre-Intervention: 37/81 respondents, 46%, p = 0.002). There was a corresponding significant increase in provision of pre-PFMT by private sector providers (post-Intervention: 16.7 ± 3.7 men/month vs pre-Intervention: 12.1 ± 3.6 men/month, p = 0.018). Survey respondents receiving pre-PFMT had significantly lower ICIQ-UI Short Form sum-score (pre-PFMT: 6.2 ± 5.0 vs no-PFMT: 9.2 ± 5.8, p < 0.001).

Conclusions: The multicomponent intervention increased provision/receipt of pre-PFMT among patients having radical prostatectomy. Additional component strategies aimed at increasing utilisation of public sector providers may be necessary to further improve uptake of men having radical prostatectomy in the public hospital system.

Key Practice Points:
- Strong research evidence for pelvic floor muscle training does not ensure its receipt by men
- Theory-based interventions can improve uptake of pelvic floor muscle training
- Interventions should address locally identified barriers to pelvic floor muscle training.

STRATEGY OF URETHRAL/BLADDER NECK MOTION DURING A VOLUNTARY CONTRACTION IS RELATED TO THAT DURING AN EVOKED, BUT NOT VOLUNTARY COUGH

Hodges PW1, Stafford R
Centre of Clinical Research Excellence in Spinal Pain, Injury and Health, The University of Queensland, Brisbane, QLD

Question: Is the pattern of urethral/bladder neck motion observed during an involuntary contraction related to the pattern of urethral motion during voluntary or involuntary evoked coughs?

Design: Cross-sectional repeated measures study.

Participants: Thirteen males with no history of incontinence or other lower urinary tract condition.

Intervention: Participants performed voluntary contractions of pelvic floor muscles with moderate effort. Cough was evaluated as a voluntary effort and evoked by breathing nebulised capsaicin.

Outcome Measures: Mid-urethral (i.e. striated urethral sphincter contraction) and bladder neck (i.e. levator ani contraction) displacements were measured with transperineal ultrasound imaging. On the basis of an earlier study, men were stratified into groups with and without a bias towards mid-urethral motion during voluntary contraction. Temporal features of coughing were evaluated from measures of intra-abdominal pressure (nasogastric pressure transducer) and expiratory airflow.

Results: Mid-urethral dorsal displacement began 305[143] ms before the rapid increase in IAP that precedes the air expulsion of the cough (p < 0.001) only in participants with bias towards motion of that urethral region during voluntary contractions and was earlier than participants with a bias towards bladder neck elevation (p = 0.049). This relationship was not observed during voluntary cough (mid-urethral displacement did not significantly precede IAP (76[205] ms)) and was not different between participant groups (p = 0.92).

Conclusion: This study confirms that healthy continent men use one of two strategies for activation of pelvic floor muscles during voluntary contractions and that this may be useful to predict the pattern of activation in an involuntary evoked cough, but not a voluntary cough.

Key Practice Points:
- Displacement of the urethra and bladder neck during voluntary pelvic floor muscle contraction may predict the strategy of activation of muscles associated with control of continence
- Transperineal ultrasound imaging of pelvic floor muscle contractions may be a useful clinical tool to guide treatment of incontinence in men
- Pattern activation of pelvic floor muscles during voluntary coughs does not replicate that during involuntary evoked coughs

TARGETED SIMULATION TRAINING TO IMPROVE TEACHING SKILLS OF PHYSIOTHERAPY CLINICAL EDUCATORS

Holdsworth C1, Delany CJ2, Skinner EH1
1Western Health, Melbourne
2The University of Melbourne, Melbourne

Question: Does a targeted immersive simulation workshop improve teaching skills of physiotherapy clinical educators?

Design: Observational prospective cohort trial. Institutional ethical committee approval was received (QA2012.83).

Participants: Six physiotherapy clinical educators and six physiotherapy students.

Intervention: Participants attended one 3-hour session in the simulation laboratory. Session content developed applied educational theory and rationale of simulated learning to student supervision. The session involved: a) educator briefing on two methods of supervision; b) two immersive clinical simulation scenarios where educators practiced supervision methods in real time with students and; c) facilitated debrief. Simulation mannequins and standardised patients were used.

Outcome Measures: A percentage scale questionnaire measuring efficacy in clinical supervision domains was developed by the authors through literature review and discussion with experts. Domains included ability to identify, reflect on and adapt teaching styles and give feedback. Educators completed pre- and post session questionnaires. Students completed post-session feedback on the impact of teaching methods on their learning. Improvement in educator self-efficacy was analysed using paired t-tests. Participants’ comments were analysed thematically.

Results: Educators reported significantly improved self-efficacy in six out of seven supervision domains. Improvement ranged from 14.2 (95% CI 27.6 to 7.2) points, p = .04 to 26.7 (95% CI 41.0 to 12.3) points, p = .005. Key themes were enhanced clinical teaching skills through safe learning environments and transparent student/program communication.

Conclusion: Educators reported improved self-efficacy in supervision skills following one 3-hour simulation session. Simulation is a potentially beneficial educational method to teach the skills of being a clinical educator.

Key Practice Points:
- This is the first time simulation has been investigated as a method to teach skills of clinical education.
- Simulation provides a safe, collegial environment for educators and students to communicate and learn together.
- Results indicate that future studies should compare benefits of simulation to traditional educational methods.

RESPIRATORY EFFECTS OF SUPPLEMENTAL OXYGEN IN PEOPLE WITH OBESITY HYPOVENTILATION SYNDROME: BEFORE AND AFTER POSITIVE AIRWAY PRESSURE

Hollier CA1,2, Harmer AR1, Maxwell LJ3, Menadue C4, Piper AJ4, Flunt D5, Black DA1, Willson GN4
1Faculty of Health Sciences, The University of Sydney, Sydney
2Department of Respiratory and Sleep Medicine, Royal Prince Alfred Hospital, Sydney
3School of Physiotherapy, Australian Catholic University, Sydney
4Faculty of Health, University of Canberra, Canberra

Question: What are the respiratory effects of supplemental oxygen on people with obesity hypoventilation syndrome; and how is this response altered by nocturnal positive airway pressure?

Design: Randomised crossover study with investigator and participant blinding.

Participants: Fourteen patients with stable, untreated obesity hypoventilation syndrome, and 14 age- and gender-matched healthy controls.

Intervention: At baseline, obesity hypoventilation syndrome and control participants breathed oxygen concentrations 28% and 50% each for 20 minutes, separated by a 45-minute washout period. Participants with obesity hypoventilation syndrome were then commenced on nocturnal positive airway pressure, and re-tested after three months.

Outcome Measures: Arterialised–venous carbon dioxide, pH, minute ventilation, and dead space to tidal volume ratio were measured every five minutes.
Results: Participants with untreated obesity hypventilation syndrome experienced mean (SD) rises in carbon dioxide of 2.0 (1.7) mmHg (28% oxygen) and 3.7 (3.2) mmHg (50% oxygen), both p < 0.001, due to falls in minute ventilation, and small rises in dead space to tidal volume ratio, pH decreased accordingly, with 50% oxygen inducing mild respiratory acidosis. For controls, carbon dioxide and pH did not change significantly with either oxygen concentration, however minute ventilation and dead space to tidal volume ratio increased. After positive airway pressure, people with obesity hypventilation syndrome experienced smaller oxygen-induced carbon dioxide rises of 1.3 (2.3) mmHg (28% oxygen) and 0.9 (1.7) mmHg (50% oxygen), both p < 0.001.

Conclusions: Supplemental oxygen worsened carbon dioxide and pH in people with stable obesity hypventilation syndrome. These responses were attenuated by nocturnal positive airway pressure.

Trial registration: ACTRN1260800172303

Funding: Physiotherapy Research Foundation*

Key Practice Points:

- High concentration oxygen may increase arterial carbon dioxide and cause acidemia in people with untreated obesity hypventilation syndrome.
- Nocturnal positive airway pressure attenuates oxygen-induced hypercapnia, but not completely.
- When providing supplemental oxygen to people with obesity hypventilation syndrome, close monitoring and targeting of oxygen saturations is recommended.

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**NEW**

**DOES LOCAL ANAESTHESIA AFTER CORONARY ARTERY BYPASS GRAFT SURGERY IMPROVE PAIN CONTROL AND WALKING DISTANCE?**

**Hong SS**, Alison JA, Milross MA, Dignan R

1 Physiotherapy Department, Liverpool Hospital, Sydney
2 Discipline of Physiotherapy, University of Sydney, Sydney
3 Department of Cardiothoracic Surgery, Liverpool Hospital, Sydney

**Question:** Does continuous infusion of ropivacaine compared to sham infusion or usual care reduce pain and increase distance walked following CABG?

**Design:** Multicenter, double blind randomised controlled trial.

**Participants:** Elective CABG surgery patients with at least one internal mammary artery graft at two metropolitan Sydney hospitals.

**Intervention:** Before sternotomy closure, two catheters from the On-Q Pain Buster device were tunnelled parasternally in a subsectoral position. The device was filled with either normal saline (sham group) or 0.5% ropivacaine (ropivacaine group) and administered as a continuous infusion for 96 hours. The control group did not receive this device. All groups had patient-controlled analgesia.

**Outcome Measures:** Walking distance on postoperative day (POD) 1 to 4, pain scores using 10 cm visual analogue scale, and the proportion of patients discharged from physiotherapy on POD 4.

**Results:** Seventy-five participants with mean age (SD) 60 (11) years were randomised into sham group (n=25), ropivacaine group (n=26), and control group (n=24). Group as a whole (n=75) showed a significant linear increase in distance walked from POD1 to POD4 of 194 meters (95% CI [124 to 263]), and a reduction in pain score of 3 centimetres (2 to 4) p < 0.001 for both. There was no between group difference in distance walked or pain score from any post-operative day in between groups or in the proportion of participants who were discharged from physiotherapy on POD4 (p > 0.05).

**Conclusion:** Infusion of ropivacaine did not improve pain control, distance walked or physiotherapy discharge by POD 4 compared to sham infusion or control. Trial ID: ACTRN12612001243808

**Key Practice Points:**

- Current pain management of CABG using patient controlled analgesia is as effective as continuous local anaesthetic infusion in a subsectoral position.
- Pain score reduces from POD2 to 4 and walking distance increases.

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**MUSCLE CONTRIBUTIONS TO THE SINGLE LEG SQUAT IN HEALTHY YOUNG FEMALES**

Horan SA1,2, Weeks BK1,2, Carty CP1,2,3

1 School of Rehabilitation Sciences, Griffith University, Gold Coast
2 Centre for Musculoskeletal Research, Griffith Health Institute, Gold Coast
3 Queensland Children’s Gait Laboratory, Royal Brisbane and Women’s Hospital, Brisbane

The single-leg squat is an established screening tool for musculoskeletal injury risk. Although kinematic and kinetic descriptions exist, the role of individual muscle contributions to the single-leg squat remains elusive. Knowledge of such contributions may be particularly important for women who tend to be at higher risk of lower limb injury than men.

**Question:** Which muscles are the major contributors to the single-leg squat?

**Design:** Cross-sectional study.

**Participants:** 12 healthy women aged 19–25 with no history of musculoskeletal impairment.

**Intervention:** Whole body kinematics and ground reaction force measurements were captured simultaneously using a 12 camera VICON motion analysis system and an AMTI force plate as participants performed a single-leg squat. A scalable anatomical model was fitted to the 3D marker positions obtained from a standing anatomical position for each participant. An inverse kinematic approach was then used to calculate joint angles for the trunk, pelvis, and lower limbs, while net moments for the supporting leg were calculated using inverse dynamics. Muscle forces were calculated using static optimisation taking into account force-length-velocity constraints of each muscle.

**Outcome Measures:** Magnitude of muscle forces during the single-leg squat.

**Results:** The largest force contributions during the single-leg squat were from the erector spinae (mean=515N), gluteus medius (mean=300N), vasti (mean=1000N) and soleus (mean=850N) muscles.

**Conclusion:** The mono-articular muscles which primarily control lower limb sagittal plane movement are responsible for the largest muscle forces during the single-leg squat. In line with clinical practice, gluteus medius plays a significant role in performing this task.

**Key Practice Points:**

- The muscles that contribute the largest forces to the performance of the single-leg squat are the erector spinae and lower limb mono-articular muscles.
- The gluteus medius generates high muscle forces, presumably to control frontal plane motion.

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**RELATIONSHIP BETWEEN QUANTITATIVE SENSORY TESTING AND PAIN OR DISABILITY IN PEOPLE WITH SPINAL PAIN – A SYSTEMATIC REVIEW AND META-ANALYSIS**

Hübscher M1,2, Moloney N1, Leaver A1, Rebeck T1, McAuley JH1, Refshauge KM1

1 Faculty of Health Sciences, The University of Sydney, Sydney
2 Neuroscience Research Australia and The University of New South Wales, Sydney

**Question:** In spinal pain the relationship between sensory hypersensitivity and clinical pain remains unclear. We examined the relationship between pain sensitivity measured via quantitative sensory testing (QST) and self-reported pain or pain-related disability in people with spinal pain. **Design:** A systematic review and meta-analysis. **Participants:** Electronic databases were searched. Outcome measures. Correlation coefficients for the relationship between QST and pain intensity or disability were pooled using random effects models. Subgroup analyses and mixed effects meta-regression were used to assess whether the strength of the relationship was moderated by variables related to the QST method or pain condition. **Results:** One hundred forty-five effect sizes from 40 studies were included in the meta-analysis. Pooled estimates for the correlation between pain threshold and pain intensity were −0.15 (95% CI: −0.18 to −0.11) and for disability −0.16 (95% CI: −0.22 to −0.10). Subgroup analyses and meta-regression did not provide evidence that these relationships were moderated by the QST testing site (primary pain/remote).
pain condition (back/neck pain), pain type (acute/chronic), or type of pain induction stimulus (e.g., mechanical/thermal). Fair correlations were found for the relationship between pain intensity and thermal temporal summation (0.26, 95% CI: 0.09 to 0.42) or pain tolerance (~0.30). 95% CI: –0.45 to –0.13), but only a few studies were available. **Conclusions:** Our study indicates that pain threshold is either a poor marker of central sensitisation or sensitisation does not play a major role in patients’ reporting of pain and disability.

**Key Practice Points:** Reliance on pain threshold as a measure of sensitization in clinical practice is questionable. Dynamic QST or pain magnitude ratings are promising but studies are limited.

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**ISOLATION OF INFRASPINATUS IN CLINICAL TEST POSITIONS**

Hughes PC, Green RA, Taylor NF
La Trobe University, Melbourne

**Question:** Existing clinical tests for infraspinatus lack accuracy and differentiation from supraspinatus is difficult. Is there a position that isolates infraspinatus from supraspinatus and how do the contraction characteristics of lower (oblique) and upper (transverse) parts of infraspinatus differ?

**Design:** Within-participant, repeated measures experimental study.

**Participants:** 15 healthy participants.

**Intervention:** Intramuscular electromyography was used to measure the level of activation (electromyographic amplitude as a percentage of maximal voluntary contraction) of infraspinatus and supraspinatus when participants produced an isometric external rotation force at the shoulder, against manual resistance in shoulder positions of neutral, flexion, abduction and extension. Longitudinal force along the humeral axis was also applied.

**Results:** The two parts of infraspinatus demonstrated different patterns of electromyographic activation. The oblique part of infraspinatus was “markedly active” in all positions while the transverse part was mostly “moderately active”. Comparing supraspinatus with infraspinatus, it was found that infraspinatus was significantly more active than supraspinatus from the positions of shoulder flexion and neutral with the highest ratios observed in the position of shoulder flexion. Longitudinal humeral force was an important factor.

**Conclusion:** If isometric external rotation of the shoulder is performed against resistance, the oblique part of infraspinatus will be working harder than the transverse part, irrespective of shoulder position. If differentiation of infraspinatus contraction from supraspinatus is desired, external rotation should be performed from a position of shoulder flexion or neutral. Resisted external rotation in shoulder flexion may form the basis of the development of a more accurate clinical test for infraspinatus.

**Practice Points**

- It may be best to perform infraspinatus manual muscle-testing by resisted external rotation of the shoulder in shoulder flexion or shoulder neutral.
- Infraspinatus strengthening may be more effective in shoulder flexion and neutral than other shoulder positions.
- Future infraspinatus EMG studies should place electrodes in both parts of the muscle.

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**FALLS, FALLS RISK AND MUSCULOSKELETAL PAIN IN OLDER ADULTS WITH CHRONIC HEART FAILURE**

Hwang R1, van der Ham E2, Mandrusiak A1, Adsett J3, Krumins A1, Kuys S4

1Princess Alexandra Hospital, Australia
2School of Health and Rehabilitation Sciences, The University of Queensland, Australia
3Royal Brisbane and Women’s Hospital, Australia
4Allied Health Research Collaborative, The Prince Charles Hospital, Australia

**Questions:** What is the frequency of falls in older community-dwelling adults with chronic heart failure? What is the relationship between falls rate and falls risk factors? What are the location, frequency and characteristics of musculoskeletal pain?

**Design:** A prospective cross-sectional questionnaire was administered by mail.

**Participants:** Participants were recruited from three tertiary referral hospitals with established Heart Failure Services in Brisbane; had a diagnosis of heart failure, were aged 65 years or older; had not been hospitalised in the preceding 3 months and mobilised independently.

**Outcome Measures:** A questionnaire requested information on recent falls history and falls risk factors. Location and frequency of musculoskeletal pain were measured using the Nordic Musculoskeletal Questionnaire. Clinical and demographic information was collected from hospital records.

**Results:** Of 212 distributed questionnaires, 96 (45%) were returned. Thirty-four (36%) reported they had fallen in the previous 12 months. Fallers more frequently reported orthostatic hypotension (p < 0.01) and took more medications (mean = 10) compared to non-fallers (mean = 9) (p = 0.05). The majority (91%) of respondents reported musculoskeletal pain. Most frequently reported areas included lower back (60%), ankles and feet (59%), shoulders (54%) and knees (54%). No difference was found between fallers and non-fallers for the frequency of musculoskeletal pain.

**Conclusion:** This group of older adults with heart failure reported a high falls rate with significant risk factors including orthostatic hypotension and polypharmacy. It appears that musculoskeletal pain is common in this group. Further investigation with a large sample size is needed to explore this.

**Key Practice Points:**

- Frequency of falls in people with heart failure appears high.
- People with heart failure should be routinely asked about falls, episodes of orthostatic hypotension, and musculoskeletal pain.
- Increasing the number of medications taken by people with heart failure may increase their risk of falling.

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**A MULTIFACTORIAL COMMUNITY-BASED EXERCISE PROGRAM FOR REDUCING FALLS RISK AMONGST THE ELDERLY: WOULD YOU FALL FOR IT?**

Hyde Page RC
Manning Rural Referral Hospital, University of Newcastle Department of Rural Health, Taree

**Questions:** How effective is an 8-week multifactorial community-based exercise program for reducing falls risk amongst the elderly? Is there a difference in outcome measures between participants who had previously fallen, compared to participants who had not?

**Design:** Retrospective cross-sectional study.

**Participants:** One-hundred and seventy-four community-dwelling residents on the mid-north coast of NSW aged 65-years and over (Mean= 77, SD=6.72).

**Intervention:** Sixteen multifactorial falls prevention exercise programs were facilitated in small groups (n=13) over a 22-month period. Each program incorporated intensive multi-component balance, mobility and lower-limb strength training, and instigated cognitive-behavioural learning strategies to influence self-efficacy for falls.

**Outcome Measures:** Pre and post program outcome measures were recorded using the Berg Balance Scale (BBS), the Timed Up and Go test (TUG), the Five-Times-Sit-to-Stand Test (FTSST), the Near Tandem Stand (NTS) test with eyes closed and the Modified Falls-Efficacy Scale.

**Results:** Clinically significant mean improvements were recorded amongst all outcome measures at post assessment (p<0.001 all measures). Participants who had previously sustained a fall had yielded significantly greater mean improvements in all outcome measures at post-assessment compared to previous non-fallers: BBS, TUG and FTSST (p<0.001), NTS (p=0.007) and MFES (p=0.03).

**Conclusion:** Clinically significant improvements in functional balance, functional mobility, lower-limb strength and falls efficacy have been demonstrated. This is notably significant amongst participants who had previously sustained a fall. This study therefore provides preliminary evidence to suggest that a multifactorial community-based exercise program has the capacity to significantly reduce falls risk amongst elderly individuals, particularly if they have sustained a previous fall.

**Key Practice Points:**

- Multifactorial falls prevention exercise programs have the capacity to significantly reduce falls risk amongst elderly individuals.
- Falls prevention exercise interventions should be aimed at the general elderly population, however previous fallers should be targeted.
- It is recommended that interventions incorporate intensive multi-component exercise training.
LOW PATIENT RECOVERY EXPECTATIONS IN LOW BACK PAIN: PESSIMISM OR A REALISTIC APPRAISAL?

Iles R1, Taylor N2*, Davidson M2, O’Halloran P4
1Department of Physiotherapy, Monash University
2Department of Physiotherapy, La Trobe University
3Eastern Health

Low patient recovery expectations in low back pain: pessimism or a realistic appraisal?

Question: Low recovery expectations have been identified as a strong and consistent predictor of poor outcome, but how do people determine their own expectation of recovery during an episode of low back pain?

Design: Qualitative study using in depth interviews. Interviews were audio recorded and transcribed verbatim. Two researchers independently applied open coding, followed by axial coding to allow themes to emerge from the data using a constant comparison method.

Participants: Thirteen people (6 F) with non-chronic low back pain and low recovery expectations, defined as a response of 7 or less to the question, “On a scale from 0 (not certain at all) to 10 (completely certain), how certain are you that you will return to all of your usual activities one month from today?”

Results: The central theme of the person and four subthemes of pain, progress, performance and treatment emerged from the data. The formation of recovery expectations was dependent on the person’s unique appraisal of their pain, how the condition had progressed, the limitation of their performance of activities and the impact of different aspects of treatment.

Conclusion: Recovery expectation is the person’s complex appraisal of several factors to determine when they are likely to return to their usual activities. Health professionals should explore the person’s perception of these factors as part of a tailored intervention to prevent the progression to chronic low back pain.

Key Practice Points:
• Recovery expectations are the person’s appraisal of their pain, progress, performance and factors related to their treatment.
• Low expectations may indicate problems in one or several of these areas, placing the person at risk of poor outcome.
• Health professionals should explore reasons behind an individual’s low expectations of recovery.

HEALTH COACHING: IT SEEMS TO WORK, BUT WHAT IS IT?

Iles R1, Taylor N2*, Davidson M2, O’Halloran P4
1Department of Physiotherapy, Monash University
2Department of Physiotherapy, La Trobe University
3Eastern Health

Question: How does the addition of telephone coaching to usual physiotherapy care improve activity for people with non-chronic low back pain and low recovery expectations?

Design: Randomised controlled trial with post-hoc qualitative analysis.

Participants: 30 individuals with recent onset low back pain and low recovery expectations participated in the trial. Qualitative analysis was performed for 14 participants who received health coaching.

Intervention: Both groups received usual physiotherapy care, and the coaching group received five telephone-based health coaching sessions. To investigate the intervention content, qualitative analysis of notes taken by the coach during each session was conducted using previously identified factors of low recovery expectation.

Outcome Measures: The primary quantitative outcome was physical activity measured by the Patient Specific Functional Scale (PSFS). Secondary outcomes were back specific activity limitation (Oswestry), recovery expectation and pain self-efficacy. These outcomes were measured at baseline and 12 weeks later.

Results: After 12 weeks, the coaching group scored 3.0 points higher on the PSFS (95% CI 0.7 to 5.4) and had more positive recovery expectations (mean difference 3.4 points, 95% CI 1.1 to 5.7). Qualitative analysis revealed that the coaching intervention focused on mainly on goal setting and action planning, and addressed the key domains of recovery expectations across each phase of the coaching intervention.

Conclusion: Health coaching improved outcomes in this preliminary trial. Analysis of the intervention sheds light on why this type of intervention may be effective in this population and may be different to coaching in chronic conditions.

Trial registration: ACTRN12607000458437.

Key Practice Points:
• Health coaching plus physiotherapy can improve outcomes for people with non-chronic low back pain and low recovery expectations.
• The majority of health coaching in this sample addressed goal setting and action planning.
• Coaching in this population is likely to be different to coaching applied to behaviour change in chronic conditions.

MULTIFACETED CLAIMS MANAGEMENT: REDUCING COMPENSATION COSTS OF MUSCULOSKELETAL WORK INJURIES

Iles R1, Wyatt M2, Pransky G3
1Department Of Physiotherapy, Monash University
2Department of Epidemiology and Preventative Medicine, Monash University
3Liberty Mutual Research Institute for Safety

Multifaceted claims management: reducing compensation costs of musculoskeletal work injuries?

Question: Does a multi-faceted model of management of work-related musculoskeletal disorders reduce workers compensation costs and days lost from work compared to usual practice?

Design: “Quasi-experimental” pre-post design in 16 intervention companies alongside 492 control companies matched for company size and industry sector.

Participants: Claim data was extracted from the Victorian WorkCover database for 16 companies before and after the intervention was applied. Data was gathered for control companies across the same time period, for an average of 42 months.

Intervention: Multifaceted approach of work injury management based on early and appropriate intervention, proactive management of the return to work process, enhancing communication between parties and providing support for the worker.

Outcome Measures: The primary outcomes were the average number of days of compensation paid and the average cost of claims. Secondary outcomes were the total medical costs and weekly benefits paid.

Results: Information on 3,312 claims was analysed. In intervention companies the average number of days of compensation decreased from 33.5 to 14.1 (HR 0.77, 95% CI 0.67 to 0.88) and average claim cost decreased from $6,019 to $3,913 (estimated difference $2,092, 95% CI $1,318 to $3,384). Medical costs and weekly benefits paid were also lower after the intervention (p<0.05). No changes were observed across the control companies.

Conclusion: The model of claims management investigated was effective in reducing the number of days of compensation, total claim costs, total medical costs and weekly benefits. Further investigation is required to determine whether this model of intervention improves non-financial outcomes.

Key Practice Points:
• Early reporting, facilitating communication between stakeholders and supporting the worker improved cost outcomes.
• Injury managers had high levels of communication and project management skills.
• Improvements in outcomes were observed across industry types, injury location and company size.
CERVICAL SPINE STIFFNESS IN PATIENTS WITH CHRONIC NON-SPECIFIC NECK PAIN

Ingram L, Snodgrass SJ, Rivett DA

Discipline of Physiotherapy, School of Health Sciences, The University of Newcastle, Australia.

Questions: Is spinal joint stiffness increased in patients with non-specific neck pain? Does the magnitude of stiffness in those with non-specific neck pain correlate with clinical measures of self-reported pain and disability?

Design: Cross-sectional observational study.

Participants: Twelve participants with chronic non-specific neck pain whose symptomatic level was determined by an experienced physical therapist at C7, and 12 age and gender-matched asymptomatic controls.

Outcome Measures: Instrumented cervical spine stiffness measurement over the spinal process of C7, all participants; visual analogue scale (VAS) for current pain and average pain over the previous 3 days and the Neck Disability Index (NDI) in participants with neck pain. Paired t-tests were used to compare stiffness between groups and correlations were performed with Pearson’s r or Spearman’s ρ (for non-normal data) as appropriate.

Results: The mean stiffness measurement was 8.2 N/mm (SD 1.7, 95% CI, 7.1 to 9.2) for the neck pain group and 6.4 N/mm (SD 1.8, 95% CI, 5.2 to 7.5) for the asymptomatic group (p = .014). No significant correlations emerged between the magnitude of spinal joint stiffness and current pain (ρ = .039, p = .91), average 3-day pain (ρ = .007, p = .98) or NDI score (r = -.177, p = .38).

Conclusion: These results support the hypothesis that cervical spine stiffness is greater in the presence of non-specific neck pain. However, the magnitude of spinal stiffness does not appear to be related to pain intensity or level of disability.

Key Practice Points:
• Cervical spine stiffness increases in the presence of non-specific neck pain.
• The magnitude of spinal joint stiffness is not related to pain intensity, or level of disability.
• Clinical judgments regarding pain intensity and level of disability should not be inferred from examinations of spinal stiffness.

GOING UPSTREAM IN HEALTH PROMOTION: WORKING WITH AUSLAN INTERPRETERS TO IMPROVE COMMUNICATION ACCESS FOR THE VICTORIAN DEAF COMMUNITY

Bruce, R1, Gattuso, D1, Jackwitz, S1, Naseby, P1, & Riscato, L1

1 The University of Melbourne, Parkville: Students of the Doctor of Physiotherapy program.
2 Victorian Deaf Society (Vicdeaf), East Melbourne.

Sarah Jackwitz is a final year Doctor of Physiotherapy student who hopes to start working in the public health system following graduation. She completed a Bachelor of Applied Science in Human Biology degree at the University of Canberra prior to enrolling in the Doctor of Physiotherapy program. She has been involved with a three year community engagement program with Vicdeaf and has attended Movement Solutions, a private paediatric physiotherapy clinic in Brisbane, for her global placement. These experiences have reinforced her commitment to providing individuals with care that considers all aspects of their health and wellness, particularly including social and emotional components.

Questions: What are the key issues identified in a health needs analysis completed with the Vicdeaf community and how can a health promotion project support the identified needs?

Design: Health needs analysis and health promotion proposal.

Participants: Three members of the Deaf community and five Auslan interpreters associated with Vicdeaf.

Outcome Measures: A health needs assessment was conducted in 2012 in collaboration with eight members of the Vicdeaf community. Based on the results of this assessment, an upstream health promotion proposal was developed.

Results: Key issues identified from the health needs assessment included a high incidence of Occupational Overuse Syndrome (OOS) amongst Auslan interpreters, affecting the communication access of the Deaf community to healthcare. These findings then have flow-on effects in that a large demand exists for Auslan interpreters’ services where there is limited supply due to injury and stress.

WHAT DO CHILDREN WITH CALCANEAL APophysitis HAVE IN COMMON?

James A1,3, Williams C1,3, Haines T1,3

1 Peninsula Health
2 Monash Health
3 Monash University

Introduction: It is well understood that calcaneal apophysitis is a condition presenting one of most common lower limb sporting presentations in older children between the ages of 8-15 years. It is thought be an inflammation and/or tractional condition at the apophysis of the heel however there is limited research confirming causative factors. This study aimed to identify if there was any association between anthropometrics, activity or sporting pursuits, and/or quality of life impact in children who present with pain related to calcaneal apophysitis.

Methods: Children between the ages of 8-15, who had no history of trauma or systemic illness, and who had pain on medical and lateral compression of the calcaneal apophysis, were recruited. Data collected was:
- BMI (kg/m2)
- FPI – 6
- Activity levels measure by the Children’s Leisure Activities Survey
- Oxford Foot and Ankle Questionnaire
- FPI – 6
- Activity levels measure by the Children’s Leisure Activities Survey
- The Footwear Assessment Tool
- Activity levels measure by the Children’s Leisure Activities Survey

Results: 124 symptomatic children (males = 72, mean age 10.88 (+ 1.48) years) were recruited. The measures were collected and when compared to population norms, symptomatic children were found to have a higher BMI (p < 0.001) and were taller (p < 0.001). Multiple regression analysis also determined an association between the duration of symptoms (p=0.02), experiencing the pain throughout the whole day and older age Pain was also associated with a decrease in playing with friends at school and in the social setting (p = <0.001). Those children participating in more sporting activities were also found to have a greater ankle range of motion (straight leg WBL, p = 0.004, bent knee WBL p = 0.01) and commonly wore some athletic footwear (dual density athletic footwear p = 0.006). There was no association between any factors with inactivity.

Discussion: This study is the first to examine how pain associated with calcaneal apophysitis may impact on a participation at school and the pain may progress as the child gets older. The association between ankle dorsiflexion range and degree of participation in physical activity may suggest that traction on the apophysis could be an important contributor to reduced activity that is often associated with this condition. Physical activity levels were also found to be higher if the most commonly worn footwear was a dual density cushioned footwear and this may indicate impact forces may mediate the association between calcaneal apophysitis and physical activity. These findings are important for physiotherapists to ensure they consider both the biomechanical factors and the impact forces when planning treatment to assist with physical activity maintenance.

Conclusion: Auslan interpreters form an integral part of closing the communication gap between the Deaf community and the healthcare profession. Our research demonstrates that this specialised workforce require assistance in addressing their health needs in order to then ensure that the Deaf community can equitably access healthcare in a hearing society.

Key Practice Points:
• Auslan interpreters face issues in supply and demand, and have decreased awareness of how to effectively manage their own health and wellness.
• OOS is common in Auslan interpreters.
• The health of Auslan interpreters affects the ability of the deaf community to communicate with health professionals and therefore influences their access to healthcare.

Conclusion: Auslan interpreters form an integral part of closing the communication gap between the Deaf community and the healthcare profession. Our research demonstrates that this specialised workforce require assistance in addressing their health needs in order to then ensure that the Deaf community can equitably access healthcare in a hearing society.

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• The health of Auslan interpreters affects the ability of the deaf community to communicate with health professionals and therefore influences their access to healthcare.
PHYSIOTHERAPY IN A MULTIDISCIPLINARY SATELLITE MOTOR NEURONE DISEASE CLINIC

**Jeffress S1, Bennett R2, Howe J3, Lamont R1, Mills P4, Ng K1**

1Bundoora Extended Care Centre, Northern Health, Bundoora
2Calvary Health Care Bethlehem, Caulfield South

**Question:** Can physiotherapists, as part of a multidisciplinary clinic for patients with motor neurone disease, meet the needs of the patients through collaborative practice and access to care?

**Design:** Exploratory study of an existing service.

**Participants:** Patients with motor neurone disease and their carers living in the northern suburbs of Melbourne.

**Intervention:** A satellite motor neurone disease clinic developed in 2005. The multidisciplinary team includes a neurologist, respiratory consultant, respiratory scientist, specialist nursing, the local Motor Neurone Disease Association regional advisor, physiotherapy, occupational therapy, speech pathology, podiatry, and dietetics. Physiotherapists play an important role in optimising physical function, enhancing quality of life, providing education and advice on manual handling.

**Outcome Measures:** Data was collected between 2008 and 2011 on total patients seen, interventions provided, number of encounters for physiotherapy and phenotypes of motor neurone disease. Ethics approval through Northern Health is pending. A satisfaction survey with implied consent stated on the cover sheet was completed with current patients.

**Results:** Phenotype data indicated that the clinic services a normal motor neurone disease population. Physiotherapists provided care to 82% of total patients between 2008 and 2011 (N=84). Results from the satisfaction survey indicated 88% of current patients (N=12) have a high level satisfaction of services received.

**Conclusion:** This multidisciplinary clinic demonstrates a positive model of care, in which physiotherapy plays a key role. There is a high level of patient satisfaction with this model of care in the management of motor neurone disease.

**Key Practice Points:**
- Physiotherapists have a key role in the quality and provision of care in patients with motor neurone disease within a multidisciplinary team
- Multidisciplinary allied health intervention in a community setting could provide good quality and satisfactory services.
- Due to the nature of motor neurone disease, a high level of collaboration between allied health, medical, nursing and community staff is vital to ensure high quality and patient centered care; which can be replicated in other communities across Australia.

MEASUREMENT OF TERM AND PRETERM INFANT ACTIVITY USING ACCELEROMETRY

**Jensen LM1,2, Piek JP2,3, Downs J1,3,4**

1School of Physiotherapy, Curtin University, Perth
2Curtin Health Innovation Research Institute
3School of Psychology and Speech Pathology, Curtin University, Perth
4The Institute of Child Health Research and The University of Western Australia, Perth

**Questions:** What are the types, duration and pattern of daily activities in which term infants engage? Do these activities differ with age and gender? How are activities related to infant motor development?

**Design:** Prospective cross-sectional observational study.

**Participants:** 120 typically developing term infants (60 males) aged between 3 and 12 months of age.

**Outcome Measures:** Mothers completed the Daily Activities of Infants Scale (DAIS) over 24-hours. The DAIS was used to quantify the type, duration and pattern of infant daily activity as well as generating scores for individual activities and a total score. Relationships between age, duration of activities and scores were analysed; and between duration of activities and the Alberta Infant Motor Scale (AIMS).

**Results:** Infants spent on average 13 hours a day sleeping which did not vary with age. They spent on average 4.8 hours in routine care which decreased with age (p = 0.001) and 4.4 hours playing which increased with age (p < 0.001). Routine care scores (p = 0.014) and play scores (p < 0.001) increased with age. Time spent playing predicted AIMS scores but not when adjusted for age.

**Conclusion:** Clinicians working with families could benefit from using the DAIS as a way of quantifying activities in an infant’s day and using these opportunities to design interventions.

**Key Practice Points:**
- Infants spend considerable time each day in routine care and play activities.
- Routine care time decreases and play time increases during infancy.
- The Daily Activities of Infants Scale is a tool that can be used to personalise intervention strategies.

QUANTIFYING DAILY ACTIVITIES OF TERM INFANTS USING A PARENT-REPORT DIARY

**Jensen LM1,2, Piek JP2,3, Downs J1,3,4**

1School of Physiotherapy, Curtin University, Perth
2School of Psychology and Speech Pathology, Curtin University, Perth
3Curtin Health Innovation Research Institute
4Centre for Child Health Research, Telethon Institute for Child Health Research, The University of Western Australia, Perth

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THE FUNCTIONAL LIMITATIONS OF SCHOOL-AGED CHILDREN WITH JOINT HYPERMOBILITY SYNDROME

**McCloskey LD1,2, Jensen LM1,2, Murray KJ1, Wright V1**

1School of Physiotherapy, Curtin University, Perth
2Curtin Health Innovation Research Institute
3Princess Margaret Hospital for Children, Perth
4Bloorview Research Institute and Department of Physical Therapy, University of Toronto, Toronto, Canada

**Questions:** Do children with joint Hypermobility Syndrome (JHS) have decreased motor competence? Is functional balance or physical activity level different between children with and without JHS? Is motor competence correlated with balance or physical activity level in children with JHS?

**Design:** Cross-sectional exploratory study.

**Participants:** 16 children with JHS (12 girls, mean age 11.01yrs, SD 0.65) and 10 typically developing children (3 girls, mean age 11.09yrs, SD 0.78).

**Outcome Measures:** Movement Assessment Battery for Children, version 2 (MABC-2) assessed motor competence; Acquired Brain Injury-Challenge Assessment (ABI-CA) assessed high-level balance and the Youth Physical Activity Questionnaire (YPAQ).

**Conclusion:** Accelerometry is a feasible measure of infant activity. Preterm infants when corrected for gestational age are similar to their age and sex matched peers in the type and quantity of daily activity.

**Key Practice Points:**
- Accelerometry is a practical option for measuring infant activity.
- Male and female infants were equally active.
- Term and preterm infants were similar in their activity levels.
Results: Two children with JHS scored below the fifth percentile on the MABC-2 and two between the fifth and 16th percentiles. Children with JHS had lower ABI-CA total scores (r = 0.234, p < 0.05) and individual item scores (p < 0.05). There were no differences in total and weekday physical activity and sedentary behaviour levels between groups, however, children with JHS did less weekend physical activity (p < 0.05). For children with JHS, MABC-2 total score and percentile were correlated with ABI-CA total score (r = 0.722 and 0.676; p < 0.01) and weekend sedentary behaviour (r = -0.686 and -0.634; p < 0.01).

Conclusion: Children with JHS have lower motor competence, functional balance and weekend physical activity levels. Functional assessment of children with JHS is able to identify their limitations. Clinicians should consider using functional tests to target appropriate intervention strategies for participation.

Key Practice Points:
- Children with JHS are at risk of activity limitations due to low motor competence and reduced functional balance.
- These activity limitations may impact their ability to engage in physical activity and may increase their sedentary behaviour.
- Targeting the causes of their functional limitations could help increase participation.

INTER-PROFESSIONAL EDUCATION IN MAINSTREAM PRIMARY SCHOOLS – WHAT ARE THE OUTCOMES?

Jensen LM, Alen Reubenson
1 School of Physiotherapy, Curtin University, Perth
2 Curtin Health Innovation Research Institute, Perth

Introduction/background:
Health Workforce Australia provided funding to develop and implement inter-professional fieldwork models that advocate collaborative practice amongst health professional students and supervisors with the aim to improve the graduate capabilities of students. They are based on the premise that through these opportunities students will be able to improve their inter-professional communication and teamwork skills and ultimately deliver better outcomes for clients/patients.

This is a relatively new model of education and service delivery where the emphasis for physiotherapy students is preventive health and addressing the social determinants of health and education. Whilst there seems to be strong support for inter-professional education, there is a scarcity of evidence exploring the outcomes for the children and families involved in these programs.

There are a number of ways of measuring outcomes for children who participate in preventive care programs. The difficulty in the IPE setting is the variability of delivery and the content of programs. There is also the complexity of longitudinal measures to determine if programs implemented in pre-primary carry over into the late primary school years.

Purpose/objectives:
The objectives of this session are:
- to discuss existing IPE models being offered in primary schools, and
- to define outcome measures to evaluate the effectiveness of IPE.

Issues/questions for investigation or ideas for discussion:
- What outcomes are expected?
- How do we measure outcomes for children, their families, the class teacher, the school, physiotherapy students and health science students?

HEALTH, POSTURAL AND ROWING-RELATED PREDICTORS OF BACK PAIN IN ADOLESCENT FEMALE ROWERS

Johnson GM, Skinner MA
Centre for Health, Activity and Rehabilitation Research, School of Physiotherapy, University of Otago, Dunedin New Zealand

Question: What health, postural and rowing-related factors are predictive of back pain in adolescent female rowers?

Design: A prospective observational study.

Method: Rowers (n = 361, mean age 15.7 years) were recruited for the study over a period of three years. Information was gathered using a computer-based questionnaire. Postural variables were measured using a hand-held digital accelerometer, the Spinal Mouse®.

Outcome Measures: Health-related outcomes: history of asthma, asthma medication, history of treatment for back pain by a health professional in the past year, currently receiving treatment for back pain. Rowing-related variables: age commenced rowing, predominant rowing position and training regime. Postural variables: segmental and global angles of sagittal thoracic and lumbar posture registered in upright standing, end-range spinal flexion and end-range extension. Univariate and multiple logistic regression models were applied with the statistical significance level being p < 0.05.

Results: Multivariate analysis indicated that receiving treatment for back pain by a health professional in the past year was a significant indicator for predicting back pain common to all prevalence periods: lifetime (adjusted odds ratio [aOR], 5.7; 95% confidence interval [CI] 12.3 to 266.1), p < 0.01; three years (aOR, 1.8; CI, 1.1 to 3.3), p = 0.03; one year (aOR, 4.1; CI, 2.0 to 8.4) p < 0.01; and last week (aOR, 2.1; CI, 1.1 to 3.7), p = 0.014.

Conclusion: After adjustment for postural, health and rowing related factors for all prevalence periods, the strongest indicator for back pain in adolescent female rowers was history of receiving treatment for back pain from a health professional in the last year.

Key Practice Points:
- Back pain in adolescent female rowers cannot be explained by any one factor alone.
- Coaches need to take heed of adolescent female rowers reporting receiving treatment for back pain in the last year.
- Rowing position did not distinguish those female adolescent rowers with and without back pain.

FACTORS RELATED TO WORK ABILITY IN PATIENTS WITH CHRONIC WHIPLASH ASSOCIATED DISORDERS

Johnston V, Landén Ludvigsson M, Peterson G, Overmeer T, Johansson G, Pedolsson A
1 School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane
2 Department of Medical and Health Sciences, Physiotherapy, Linköping University, Sweden
3 Rehab Väst, County Council of Östergötland, Sweden
4 Centre for Clinical Research Särmland, Uppsala University, Sweden
5 School of Health, Care and Social Welfare, Mälardalen University, Västerås
6 Department of Medical and Health Sciences, Division of Community Medicine, Linköping University, Sweden

Question: Which factors are associated with good work ability in individuals with chronic Whiplash Associated Disorders?

Design: Cross-sectional study using a self-report questionnaire.

Participants: Two-hundred and sixteen individuals [mean age 49 years (SD11.4) 66% females] with chronic (greater than six months since accident) Whiplash Associated Disorders Grade 2 and 3 were recruited from primary care and orthopedic clinics in Sweden.

Outcome Measures: The Work Ability Index (scores range 7-49) was the primary and dependent outcome. Explanatory, independent variables assessed were demographics (age, sex, social situation); psychosocial (pain catastrophizing, kinesiophobia, depression/ anxiety); personal (financial situation, health related quality of life, self-efficacy to perform activities despite neck problems, job satisfaction and effort-reward imbalance at work); physical demands of work; and condition related (dizziness, neck disability index and pain lines). Linear multivariate forward step-wise regression modeling was used.

Results: Thirty-seven percentage of the individuals reported good/excellent work ability (score 37-49) and 40.5% poor/ moderate work ability (score 7-36). Seven factors explained 75% of the variance in self-rated work ability. In descending order of importance these factors were low disability on the Neck Disability Index, good financial situation, not working with arms above shoulder height, good health related quality of life on the Euroqol thermometer, low imbalance on the Effort-Reward Imbalance, low level of dizziness during movement, high self-efficacy to perform activities despite neck problems and good workplace satisfaction.

Conclusion: A combination of individual and work-related factors appear to be important for those with a chronic whiplash associated disorder to remain at work.

Key Practice Points:
- Neck-specific disability was the most important factor related to work ability, explaining 50% of the variance.
- Neck-specific function, neck-related dizziness and self-efficacy of performing activities despite the neck included as well as work related factors are all factors of importance for work ability and need to be considered in rehabilitation.
THE CURRENT STATUS OF PHYSICAL THERAPY IN CHINA

Jones AYM1,2, Skinner MA1,4
1Faculty of Health Sciences, University of Sydney
2School of Rehabilitation Sciences, Griffiths University, Brisbane
3WCPT Executive Member, World Confederation for Physical Therapy
4School of Physiotherapy, University of Otago, Dunedin, New Zealand

The presentation aims to discuss the status of physiotherapy education in China in the context of China’s strategy to improve national health and engage with international policy. The current health care system in China has evolved by embracing traditional Chinese and Western medicine, however physiotherapy is still not a profession recognized by the Chinese Government. The majority of personnel engaged in rehabilitation are therapists working under the supervision of rehabilitation medicine doctors. To produce physiotherapy curricula which are consistent across China and of an international standard, the World Confederation for Physical Therapy (WCPT) has advocated the WCPT’s Guidelines for physical therapists professional entry-level education be adopted by the physiotherapy programmes. Universities have also been encouraged to undergo a standardized accreditation process. To date, Kunming Medical University and Sichuan University have successfully completed the WCPT’s accreditation process.

China is a huge country and the challenge ahead in promoting cardiopulmonary physiotherapy services in thousands of hospitals is daunting. Australian physiotherapists are at the forefront of physiotherapy education and opportunity exists for participation in the design of online courses, workshops, and engaging in exchanges, mentoring and clinical attachments. Exposure to a health care system providing for 1.4 billion people is not only an education smorgasbord for the Australian physiotherapy professional but also an opportunity

Key Practice Points:
- Strong support from the Chinese Government to develop rehabilitation services meeting international standards
- Cardiopulmonary physiotherapy per se is not practiced in China
- Opportunities exist for exchange and collaborative activities to promote the physiotherapy profession in China

THE DEVELOPMENT OF EDUCATION IN CARDIOPULMONARY PHYSIOTHERAPY IN CHINA

Jones AYM1,2, Skinner MA1,4
1Faculty of Health Sciences, University of Sydney
2School of Rehabilitation Sciences, Griffiths University, Brisbane
3WCPT Executive Member, World Confederation for Physical Therapy
4School of Physiotherapy, University of Otago, Dunedin, New Zealand

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EXPECTATIONS, FEARS AND PAIN EXPERIENCE: IDENTIFYING EXTERNAL AND INTERNAL THREATS TO PERCEIVED SAFETY OF WOMEN IN TWO BIRTHING ENVIRONMENTS

Jones LE, Whitburn L Y, Davey M-A, Small R
La Trobe University, Melbourne

Questions: What experiences do women bring to childbirth that are associated with pain perception? What ante-natal and peri-natal factors do women describe as important for their safety during childbirth? Are these factors different across two birth environments? How do women describe their experiences, expectations and fears during labour?

Design: Mixed

Methods: phenomenological design using semi-structured interview (derived from modified version of Pain and Movement Reasoning Model) and a battery of questionnaires specific to pain or childbirth experiences.


**SURVIVORS OF TORTURE: WHERE IS THE PAIN COMING FROM?**

**Block M, Jones LE**, **Kelly D**

1. Western Region Health Centre
2. La Trobe University
3. Victorian Foundation for Survivors of Torture and Trauma
4. University of Melbourne

**Introduction/background:** Pain is a complex human experience. It has long been attributed to tissues of the body but increasingly is understood to be a part of a comprehensive body protection system. As such it is influenced and even determined by cognitive-evaluative, affective-emotional as well as sensory-discriminative factors. Survivors of torture and trauma often present with somatic symptoms that can be resistant to traditional physiotherapy approaches. There is a need to enhance pain management for people who have survived these experiences. **Purpose/objectives:** The aim of this session is to enhance understanding of the pain experience of survivors of torture and trauma. Participants will discuss and respond to a scenario, representative of cases seen by three experienced physiotherapists working in refugee health, use a tool, the Pain and Movement Reasoning Model, to promote an integrated evaluation of the pain experience, and complete a plan of action incorporating relevant health disciplines and services. Strategies for adapting the plan to attending to cultural influences and perspectives of the client will also be discussed.

**Issues/questions for investigation or ideas for discussion:** What experiences do physiotherapists have of treating survivors of torture and trauma? How do we formulate treatment for survivors who invariably have a complex social, psychological and medical history? What are the services and resources available that can help physiotherapists working with survivors enable effective pain management?

**Key Practice Points:**

- Pain is multidimensional and part of a body protection system
- Person-centred care promotes shared understanding and trust
- Pain management for survivors of torture and trauma needs to be interdisciplinary and also culturally safe

**PELVIC PAIN: DEVELOPING A TOOL TO ENHANCE EDUCATION AND ASSIST CLINICAL REASONING**

**Jones LE**, **Sheat R**, **Sherburn M**

1. La Trobe University
2. empoweRehab
3. Bounce Blackburn
4. Royal Women's Hospital
5. University of Melbourne

**Introduction/background:** Pain is part of a comprehensive body protection system. As such it is influenced and even determined by cognitive-evaluative, affective-emotional as well as sensory-discriminative factors. This would seem particularly relevant to pelvic pain where clients may be survivors of abuse and are often stigmatised. As current pain theory is adopted into clinical areas including Women’s and Men’s Health, there is a need to find useful tools to enhance the education of health professionals and assist clinical reasoning. The Pain and Movement Reasoning Model was initially designed as an educational tool for physiotherapists and learner physiotherapists working in musculoskeletal settings. The Model provides a template that encourages decisions about pain as multidimensional. Its format has proven adaptable and is currently being trialled in a breastfeeding clinic to assess and educate on breast and nipple pain. It would seem appropriate to consider modifying this tool for pelvic pain. **Purpose/objectives:** The aim of this session is to enhance understanding of the pain experience of men and women with pelvic pain. Participants will deconstruct the categories of the Pain and Movement Reasoning Model in order to reconstruct a new version specific to pelvic pain.

**Issues/questions for investigation or ideas for discussion:** What are the determinants of pelvic pain? How are these best categorised to reflect input from local pathology and processes, input from regional structures or influences and input from central modifiers that affect nervous system sensitivity?

**Key Practice Points:**

- All pain is multidimensional.
- Physiotherapists need a systematic approach to effectively assess and manage pain.
- Bespoke tools can enhance education of staff and clients and assist clinical reasoning.

**DOES HAND HELD DYNAMOMETRY FOR CALF MUSCLE STRENGTH REFLECT ANKLE POWER GENERATION DURING WALKING?**

**Kahn M**, **Williams G**

1. Epworth Healthcare
2. The University of Melbourne

**Design:** Prospective cross-sectional study.

**Participants:** 103 patients who had mobility limitations following traumatic brain injury.

**Outcome Measures:** Hand held dynamometry was used to measure calf muscle strength. Three dimensional gait analysis was performed to quantify ankle power generation at push off. Mobility performance was quantified by self-selected walking speed and the high level mobility assessment tool (HiMAT).

**Results:** Hand held dynamometry measures for the calf were moderately correlated with ankle power generation at push off ($r = 0.428$, $p < 0.001$). There was a weak correlation between the hand held dynamometry calf strength measures and self selected walking velocity ($r = 0.316$, $p = 0.002$). The relationship between hand held dynamometry calf strength measures and HiMAT scores was also weak ($r = 0.327$, $p = 0.002$).

**Conclusion:** Static hand held dynamometry calf strength measures are only moderately correlated to ankle power generation at push off. Hand held dynamometry measures only account for a minority of the variability in ankle power generation.

**Key Practice Points:**

- Static hand held dynamometry measures of calf muscle strength do not reflect calf muscle function in gait.
- Measures of calf muscle strength using hand held dynamometry are poor predictors of ankle power generation during walking.
- Hand held dynamometry is a poor predictor of calf muscle function for walking and high level mobility.
CLINICAL SUPERVISION SKILLS: AN IMPORTANT KEY TO EXPERT AND NOVICE PHYSIOTHERAPISTS IN LEARNING PROCESS

Karthikeyan P1, Ramalingam PK2
1Lecturer, Divine Word University, Madang, Papua New Guinea
2Senior Lecturer, Divine Word University, Madang, Papua New Guinea

Question: Is clinical supervision as capacity building well received by Papua New Guinea national physiotherapists?
Design: Observational study
Participants: Ten national physiotherapists; 8 from provincial hospitals and 2 tutors from Divine Word University.
Intervention: Training on clinical supervision was designed as five days short course. The course was developed to meet the needs of very new graduates with minimum clinical experience in the field of physiotherapy, so as to train them as professional clinical supervisors. The course was introduced with lectures on models of supervision, importance of clinical education which included case scenarios and role plays.
Outcome Measures: Participant satisfaction was evaluated using an instructor designed evaluation form. The evaluation form consists of three categories on course content, material and the instructor performance.
Results: National physiotherapists reported: the training was a stepping stone to fulfill the supervisory duties. The participants scored an overall satisfaction with a median score of 5 (excellent).
Conclusion: Clinical supervision training for national physiotherapists is an essential course to reduce the reliance on overseas trained physiotherapist volunteers also to assist and supervise student physiotherapists. This study highlights the benefits that participants found in attending this training.
Key Practice Points:
• Clinical supervision plays an important role in the education of student physiotherapists.
• Physiotherapy in Papua New Guinea is a new profession with only one physiotherapy program started at Divine Word University as a diploma course in 2003 and upgraded to a degree course in 2009.
• Given the newness of the profession training in clinical supervision is imperative to enhance student learning.
• Introduction of training in clinical supervision has been very well received.

MOVING PATELLOFEMORAL PAIN WITH INFRA-PATELLELLAR TAPING

Keays SL
Private Practice, Sunshine Coast, The University of the Sunshine Coast

Question: Does infrapatellar taping have an immediate effect on pain and isokinetic performance in patients with patellofemoral pain (PFP)?
Design: Single case study.
Participants: Male participant, aged 51 years old with severe PFP for over 12 months.
Intervention: Infrapatellar taping was applied to the left knee following a clinical examination and baseline assessment including isokinetic strength/performance using a Cybex II dynamometer, and pain going down stairs.
Outcome Measures: The following measures were recorded at baseline and immediately after the application of tape: Pain level on a visual analogue scale (VAS) 1-10 during stair descent and during isokinetic testing at 60° per second; highest peak torque achieved for the quadriceps and hamstrings during isokinetic testing.
Results: The application of infra-patellar taping reduced the pain level going downstairs from 8.9 to 3 and reduced pain during isokinetic testing from 6 to 2. Quadriceps peak torque pre-tape was 18.1 ft lbs and with tape was 60.7 ft lb. Hamstring peak torque was 54 ft lbs pre and post-taping.
Conclusion: Infrapatellar taping can be very effective in producing an immediate difference in pain and isokinetic performance. However not all cases of PFP will respond similarly.

Key Practice Points:
• Infrapatellar taping can be effective in reducing pain and improving performance in some patients with PFP.
• Taping should be used in conjunction with other treatment.
• Treatment is determined by individual assessment of local and global factors including muscle strength and length, lower limb alignment and movement patterns.

OLD AND NEW MOVES IN THE TREATMENT OF PATELLOFEMORAL PAIN: A THREE YEAR FOLLOW-UP

Keays SL1, Mason M1, Newcombe P2
1Private Practice, Sunshine Coast
2The University of Queensland, Brisbane

Question: Is the improvement achieved following one month of standardized local and individualized global physiotherapy in patients with patellofemoral pain (PFP) maintained for three years?
Design: Longitudinal cohort study.
Participants: Forty-one patients (60 knees) with PFP including patellofemoral osteoarthritis. Ethical clearance was not required.
Intervention: Patients attended four physiotherapy sessions comprising localized treatment (quadriceps strengthening, quadriceps stretching, infrapatellar taping) for Fortnight 1, supplemented with individualized treatment for Fortnight 2, followed by ongoing home self-management. Individualized treatment, based on assessment comprised posture correction, lower limb movement retraining and muscle stretching.
Outcome Measures: Seven outcome measures assessed at four time-frames, included: isokinetic quadriceps strength, quadriceps length, eccentric quadriceps control and four pain measures. Global measures, which directed individualized treatment, included postural assessment, movement alignment patterns and muscle tightness. Long-term measures included pain recurrence necessitating further treatment, Kujala score and return-to-activity.
Results: The improvements in outcome measures after Fortnight 1 (p<0.001) and Fortnight 2 (p<0.05) were maintained long-term with only 7% of patients needing further intervention. In six of seven measures there was no significant deterioration (pd from 0.052 to 0.423) comparing one month to three-year outcomes. On final testing 73% of patients were pain-free and the remaining 27% had less pain than pre-treatment. Pre-treatment Kujala scores improved by 27% (p<0.001). Eighty-eight percent of patients resumed any sport stopped because of PFP and 54% of patients started new sports/activities.
Conclusions: Significant improvements from four PFP treatments over one month combining local and individualized approaches were maintained long-term.
Key Practice Points:
• PFP can be significantly reduced in one month with improvement maintained for three years.
• Treatment should incorporate both an older local ‘gold standard’ as well as a newer more individualized global approach.
• Individualized treatment should be based on detailed assessment including postural alignment, movement patterns and tight muscles.
physical impairments in hip range and strength are greater in those with chondropathy and in females following hip arthroscopy

Kemp JL, Schache AG, Makkelsi M, Sims K, Pritchard MG, Crossley KM
1 School of Health and Rehabilitation Sciences, University of Queensland, Brisbane, Australia
2 Melbourne School of Physiotherapy, University of Melbourne, Melbourne, Australia
3 Hip Arthroscopy Australia

Question: Do physical impairments exist between men and women, and in people with and without chondropathy post hip arthroscopy compared to a group of age matched controls. Study Design: Cross sectional study.

Participants: One hundred patients (49 female; age=35±10yr; height=1.75±0.10m; weight=79±12kg) 12-24 months post hip arthroscopy; and 60 controls (41 female; age=36±9.6yr; height=1.71±0.94m; weight=68±12kg).

Intervention: Patients were grouped into those with (CHA) and those without (OHA) chondropathy.

Outcome Measures: Hip range (measured using inclinometer) and strength (normalised peak torque measured with handheld dynamometer).

Results: Between group differences existed for hip flexion (p=0.043) and internal rotation (IR)(p=0.001) range; and for abduction (AD)(p=0.002); extension (EX)(p=0.001); flexion (FL) (p=0.001); IR(p=0.002) strength. Between gender differences existed for external rotation (ER) range(p<0.001); and abduction (AD)(p=0.001), AD(p=0.004), ER(p=0.001) strength. Post hoc analysis revealed CHA had lower range of hip IR (p=0.001); and lower AD(p=0.001), EX(p=0.001), FL(p<0.001) and IR(p<0.001) strength compared to controls and OHA. OHA only exhibited lower AD(p=0.008) strength compared to controls. An interaction between group and gender was seen in hip abduction strength(p=0.025).

Conclusions: Physical impairments exist in people who are 12-24 months post hip arthroscopy compared to controls. People with chondropathy and women have greater impairments. This study may enable therapists to provide rehabilitation programs that are targeted to address specific deficits, thus potentially enhancing post-operative outcomes in this population.

Key Practice Points:
• People with chondropathy and women have greater impairments 12–24 months post-hip arthroscopy.
• Rehabilitation programs may need to be tailored based on gender and the presence of chondropathy.
• Current rehabilitation protocols recommending physiotherapy for up to six months post-operatively may not be adequate, or include enough strength-based training interventions.
HIP CHONDROPATHY AT ARTHROSCOPY IS ASSOCIATED WITH LABRAL PATHOLOGY; AND IS MORE PREVALENT AND ASSOCIATED WITH WORSE OUTCOMES IN WOMEN

Kemp JL1, Makdissi M2, Schache AG1, Pollard TCB1, Pritchard MG3, Crossley KM1
1School of Health and Rehabilitation Sciences, University of Queensland
2Melbourne School of Engineering, University of Melbourne
3Melbourne School of Physiotherapy, University of Melbourne

Background: Hip arthroscopy can be used to address conditions associated with hip pain, such as femoroacetabular impingement (FAI) and labral pathology. The relationship between chondropathy and adverse outcomes following hip arthroscopy is not well understood. The purpose of this study was to investigate whether the presence of chondropathy at the time of arthroscopy predicted adverse outcomes in people undergoing hip arthroscopy surgery.

Methods: A single cohort, observational, longitudinal study was conducted. Participants (N=156) were compared to the same period post-intervention (n=158). Emergency readmission rate was monitored as a secondary outcome.

Results: Multiple regression analyses revealed that in men, reduced flexion range (r²=0.310-0.530; p=0.005 to <0.001) predicted worse outcomes on all HOOS subscales and iHOT-33; whilst weaker hip abduction strength (r²=0.263-0.360; p=0.010 and p=0.002) predicted worse HOOS pain and ADL subscales. In women reduced hip flexion range (r²=0.107-0.167; p=0.046 to 0.016) predicted worse HOOS symptoms, ADL, sport, quality of life and iHOT-33; whilst reduced hip extension, abduction, adduction and external rotation strength (r²=0.140-0.207; p=0.026 to 0.008) predicted worse outcomes on all HOOS subscales and the iHOT-33.

Conclusions: Reduced flexion range predicts worse outcomes in both men and women with chondropathy following hip arthroscopy, however women have a wider variety of strength impairments (extension, abduction, adduction and external rotation) than men (abduction only) predicting outcome. This study may assist therapists in the provision of appropriate targeted rehabilitation programs for people of both genders with chondropathy following hip arthroscopy, and ensure programs are tailored to optimize outcomes in this patient group.

Key Practice Points:
- Impairments predicting outcome following hip arthroscopy for people with chondropathy vary between genders.
- Hip flexion range predicts outcome in both genders, however a wider variety of strength impairments predict outcomes in women.
- Rehabilitation programs should be tailored for each gender, in order to optimize outcomes for this patient group.

METHOD OF PATIENT EDUCATION PRIOR TO ORTHOPAEDIC ARTHROPLASTY CAN INFLUENCE HEALTHCARE OUTCOMES

Kenny J
Austin Health

Question: Does the way pre-admission information is delivered influence length of stay and discharge destination following knee and hip arthroplasty?

Design: Single cohort, observational, longitudinal study.

Participants: Convenience sample of patients attending pre-admission clinic in a major tertiary hospital.

Intervention: Changes to existing process and method of information delivery were made to provide clear and consistent messages to patients prior to orthopaedic arthroplasty surgery. Beliefs of the healthcare team were addressed and aligned. A positive approach while delivering information was adopted, emphasizing active patient participation. Inpatient rehabilitation was removed from the discussion. Verbal education was augmented with the introduction of comprehensive written information and a complimentary DVD. A patient-led pathway was added to enhance patient engagement and empowerment.

Outcome Measures: Primary outcomes were average acute length of stay and percentage of patients discharged directly home from the acute setting. Five months prior to intervention (n=156) was compared to the same period post-intervention (n=158). Emergency readmission rate was monitored as a secondary outcome.

Results: Average acute length of stay showed a small improvement from 4.91% to 4.86%. The percentage of patients discharged directly home increased from 57% to 72%. Emergency readmission rate dropped by 36%.

Conclusion: The way information is delivered to patients prior to hip and knee arthroplasty can reduce reliance on inpatient rehabilitation services without negatively affecting length of hospital stay or patient safety. No ethics required.

Key Practice Points:
- Healthcare teams should adopt a positive and consistent approach to the delivery of pre-admission information to reduce the utilization of rehabilitation services post arthroplasty.
- Patient education may be enhanced with the use of multi-media delivery methods.
- Further investigation of patient satisfaction and follow up of functional outcomes is warranted.
PATIENT AND EDUCATOR PERCEPTIONS OF STUDENT INVOLVEMENT IN PRIVATE PRACTICE CONSULTATIONS

Kent P1,2, Richards K1, Morgan P1, Haines T1, Maloney S1, Keating J1
1Monash University
2Monash Health

Questions: What are patients’ views about students providing care in private practice settings? What are patients’ preferences in regard to the type of activities performed by students in private practice settings? What are practitioners’ perceptions of student participation in private practice settings?

Design: Mixed methods, combining patient survey data and practitioner interviews.

Participants: Sixty-three patients who were attending private practice consultations. Four private practitioners were interviewed, one from each of the sites collecting patient questionnaires.

Outcome Measures: Patients reported on their degree of comfort with different aspects of student care. Practitioner interviews were transcribed and analysed for themes by two investigators.

Results: Patients typically accepted student presence in a consultation. They expressed varying preferences regarding the degree of student involvement. A subset considered it quite acceptable for students to provide health services. Practitioners reported barriers to increasing education opportunities as lack of time, cost, and limited skills of students. They wanted better preparation for the role of educator.

Conclusion: Many private practice patients are agreeable to student’s providing health services. Routine identification of these patients is possible and desirable. Better preparation of both educators and students may improve the important clinical learning opportunities in private practice. This project was possible due to funding made available by Health Workforce Australia and the Department of Health, Victoria.

Key Practice Points:
• Patients are generally supportive of undergraduate education within private practices
• Practitioners report a lack of time, educator skills, patient reluctance, cost and student inexperience as barriers to student involvement.
• Better preparation of both students and private practitioners is recommended to facilitate improved learning opportunities in private practices.

PHYSIOTHERAPY IN ADULT CHRONIC CONSTIPATION

Khera A

Chronic constipation is a common condition in the community with prevalence ranging from 6–30% in adults (1). Constipation is related to slowed gut motility, difficulty with rectal emptying or a combination of both. At least one third of patients with chronic constipation have an evacuation disorder (2). This is characterized by infrequent defaecation, excessive straining, abdominal pain, bloating, digitation and incomplete emptying. This also includes patients with constipation predominant irritable bowel syndrome where abdominal pain is a key symptom. Evacuation disorders are associated with failure of any combination of the pelvic floor, abdominal, rectal, sphincter or diaphragm muscles to coordinate the defaecation process. Structural disorders such as excessive perineal descent, rectal prolapse, rectocele, solitary rectal ulcers, anal fissures and haemorrhoids may be implicated and are often related to excessive straining with attempts to defaecate. There are also additional complexities associated with previous surgeries and/or other pathologies such as inflammatory bowel disease.

Physiotherapists are perfectly placed to provide treatment for these conditions due to their understanding of striated muscle function, respiration, posture, control, coordination and their ability to use behavioural techniques, electrotherapy & biofeedback as treatment modalities.

However, the successful management of functional anorectal disorders requires additional strategies to that of standard pelvic floor muscle rehabilitation. The nature of these disorders demands a biopsychosocial and multidisciplinary approach because of the strong connection between physical symptoms and psychological factors. Behavioural therapy is an effective and safe treatment for chronic intractable constipation with benefit in up to 78 percent of patients (2–6) and can be offered by pelvic floor physiotherapists in public and private clinical settings.


EVALUATION OF A MEDITATION BASED STRESS REDUCTION (MBSR) PROGRAM DURING ACQUIRED BRAIN INJURY REHABILITATION IN AN INPATIENT SETTING: A PRELIMINARY STUDY

Killington M1, Pizzilli R1, Immink M2
1South Australia Brain Injury Rehabilitation Services, Hampstead Rehabilitation Centre
2School of Health Sciences, University of South Australia, Adelaide

Question: Is it feasible and efficacious to undertake MBSR as an inpatient after ABI?

Methodology: Clinical outcomes for 5 individuals undertaking MBSR were compared to 5 participants engaging in a diversion and relaxation group. Measures included The Generalized Anxiety Disorder Scale (GAD7), Satisfaction with Life Scale, 10 point Likert scale to measure fatigue, cognitive performance measures, guided interviews to evaluate level of “mindfulness” and Goal Attainment Scale (GAS) to determine whether participants achieved their specific personal goals.

Results: Results were generally underpowered due to the small number of recruits; however statistically significant improvements resulted for the GAS goals of those who undertook MBSR compared to the diversion and relaxation group which showed no statistically significant improvements. Also, those in the MBSR group showed statistically significant improvements when selective attention performance measures were evaluated suggesting that MBSR training enhanced attention to salient information. Also, although not statistically significant, those who undertook MBSR demonstrated their decision making was less influenced by introducing more choices and potentially they handled uncertainty better than those in the active control group.

Conclusion: This research suggests that it is feasible for people with an ABI to undertake MBSR in the inpatient phase of their rehabilitation and that a mind-body medicine approach to rehabilitation can be a useful adjunct to more traditional rehabilitation interventions. The positive results from some of the measures and trends in others suggest that further research should be undertaken with larger numbers of participants.

Key Practice Points:
• It is feasible for people with an Acquired Brain Injury to engage in Meditation Based Stress Reduction programs in the inpatient phase of their rehabilitation.
• There are indications that selective attention and decision making may improve in response to undertaking MBSR after ABI.
• Further high quality evidence is needed in this emerging area of mind-body medicine.

1Peppas G, Alexiou VG, Mourtzoukou E, et al. Epidemiology of constipation in Europe and Oceania: a systematic review. BMC Gastroenterol. 2010;10:65.
3Chiarioni G, Whitehead WE, Pezza V, Morelli A and Bassotti G. Biofeedback is superior to laxatives for normal transit constipation due to pelvic floor dyssynergia. Gastroenterol. 2006; 130: 657–664.
**FACTORS LIMITING ADHERENCE TO A 12-MONTH HOME EXERCISE INTERVENTION AS REPORTED BY PARTICIPANTS AND THERAPISTS**

Kirkham C1, Lord SR2, Vogler CM1, Close JCT3, Howard K4, Dean CM5, Clemson LB6, Barralough EL, Ramsay E5, O’Rourke SD7, Cumming RG1

1. The George Institute for Global Health, University of Sydney, Sydney, NSW, Australia
2. Neuroscience Research Australia, University of Sydney, Sydney, NSW, Australia
3. Northmead Clinical School, University of Sydney, Sydney, NSW, Australia
4. School of Public Health, University of Sydney, Sydney, NSW, Australia
5. Department of Health Professions, Macquarie University, Sydney, NSW, Australia
6. Faculty of Health Sciences, University of Sydney, Sydney, NSW, Australia
7. University of Queensland, Brisbane, Australia

**Question:** Which factors were reported by participants and therapists to limit adherence to a 12-month home exercise intervention in a randomised controlled trial among older adults recently discharged from hospital?

**Design:** Following the 12-month intervention, each participant and his/her treating physiotherapist were asked whether 14 factors limited the individual’s uptake of the home exercise program. Participants were able to report more than one limiting factor.

**Participants:** 155 people.

**Outcome Measures:** 14 factors reported by participants and therapists.

**Results:** The study physiotherapists reported a total of 339 limiting factors among the 155 intervention group participants for whom data were available. Of these factors, medical conditions accounted for 24% (n=80) and pain accounted for 36%; back pain n=38 (11%), knee pain n=36 (11%) and other pain n=44 (13%). Hospitalisation accounted for 12% (n=39) of reported factors. There were a total of 226 exercise-limiting factors reported by participants and of these 32% (n=72) were illness or injury, 14% (n=33) exacerbation of medical condition with exercise. Being too tired n=46 (20%) or too busy n=29 (13%) were other reasons for non-compliance. Only 2% (n=5) of reported factors reflecting no benefit from the program or no perceived need for the exercises, 8% (n=17) of participants reported that they did not like exercise or home exercise and 4% (n=9) reported the exercises being too hard.

**Conclusion:** Adherence to this home exercise program was more strongly related to illness, injury or pain rather than disinterest or irrelevance.

**Key Practice Points:**
- One or more limiting factors for exercise adherence were reported for 155 participants in the 12-month intervention.
- Illness, injury or pain most limited adherence to this home exercise program both in physiotherapist and participant report.
- Few perceived irrelevance or disinterest as limiting factors to adherence.

**WHAT IS OPTIMAL TENSION IN ACL RECONSTRUCTION? A SYSTEMATIC REVIEW OF FUNCTIONAL OUTCOMES**

Kirwan GW1-3, Bourke MG4,5, Chipchase L4, Dalton PA4, Russell TG6

1. Department of Physiotherapy, QEII Jubilee Hospital, Metro South Health, Brisbane
2. Department of Orthopaedic Surgery, QEII Jubilee Hospital Metro South Health, Brisbane
3. Division of Physiotherapy, School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane
4. Division of Physiotherapy, School of Science and Health, University of Western Sydney, Sydney
5. Division of Physiotherapy, School of Rehabilitation Science, Griffith University, Gold Coast

**Question:** Does the use of a tensioning device rather than a traditional manual tensioning method improve functional outcomes after anterior cruciate ligament surgery?

**Design:** Prospective double blind randomised controlled trial with concealed allocation, patient and assessor blinding and intention-to-treat analysis.

**Participants:** Twenty-three individuals who underwent anterior cruciate ligament reconstruction at the QEII Jubilee Hospital, Brisbane.

**Intervention:** At the time of surgery participants were randomly assigned to one of two groups based on tensioning method. One group underwent tensioning of a semitendinosis gracilis graft with a tensioning device set at 60N and 40N. The other group underwent manual graft tensioning performed by the surgeon.

**Outcome Measures:** The primary outcome measure was the International Knee Documentation Committee Score for function. Secondary outcomes included the Lysholm Score, Tegner Score, Hop Test for distance and KT1000 knee arthrometer.

**Results:** There was no significant interaction between tension method and time for the patient reported outcome measures (International Knee Documentation Committee Score p = 0.76; Lysholm Score p = 0.12). KT1000 measurements showed no significant interaction between tension method and time (KT1000 30 lbs p = 0.63; KT1000 maximum manual displacement p = 0.69) and Hop Test for distance also demonstrated no significant interaction (p = 0.89).

**Conclusion:** Using a tensioning device did not improve functional outcomes after anterior cruciate ligament reconstruction.

**Trial registration:** ACTRN012606000389505

**Key Practice Points:**
- Tension is regarded as a key factor to improving outcomes post anterior cruciate ligament reconstruction however there is limited evidence with respect to the amount of tension required to improve functional outcomes.
- The use of a tensioning device may serve as a training device or improve consistency in outcomes post anterior cruciate ligament reconstruction.

**ACL GRAFT TENSIONING FOR OPTIMAL FUNCTION. A RANDOMISED CONTROLLED TRIAL**

Kirwan GW1,3, Bourke MG1-5, Chipchase L4, Dalton PA4, Russell TG6

1. Department of Physiotherapy, QEII Jubilee Hospital Metro South Health, Brisbane
2. Department of Orthopaedic Surgery, QEII Jubilee Hospital Metro South Health, Brisbane
3. Division of Physiotherapy, School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane
4. Division of Physiotherapy, School of Science and Health, University of Western Sydney, Sydney
5. Division of Physiotherapy, School of Rehabilitation Science, Griffith University, Gold Coast

**Question:** How does the use of a tensioning device rather than a traditional manual tensioning method improve functional outcomes after anterior cruciate ligament surgery?

**Design:** A systematic review of randomised trials with quantitative analysis.

**Participants:** Participants who underwent an anterior cruciate ligament reconstruction using either a semitendinosis-gracilis or patella-tendon graft.

**Intervention:** Graft tension was defined as the amount of tension applied prior to fixation as measured by a tensioning device. Tension was reported in Newton’s and categorised as low (20N - 45N), medium (78.5N - 90N) or high (117.7N - 147.1N).

**Outcome Measures:** Functional outcomes were most commonly assessed by side-to-side difference in anterior tibial displacement as measured by a knee arthrometer. Other measures included the International Knee Documentation Committee Score, Lysholm Score, strength of the quadriceps muscles, range of movement and the hop test.

**Results:** Five articles met the criteria set out for the review. Side-to-side difference in anterior tibial displacement was the only outcome measure with adequate reporting to undertake effect size calculations expressed as the standardised mean difference (SMD). Eighty Newtons and 78.9N produced the largest effect at two weeks or less post surgery and at 12 months post surgery (SMD = 2.98, 95% CI -3.83 to -2.14; SMD = 2.45, 95% CI -3.40 to -1.51). When comparing the amount of tension applied the largest effect was towards 60N when compared with 20N at less than two weeks post surgery (SMD 0.76, 95% CI 0.17 to 1.35).
**Conclusion:** A medium graft tension at fixation (78.5N – 90N) produces less anterior tibial translation both immediately post surgery as well as at 12 months. There was insufficient evidence to comment on the effect of graft tension on patient function.

**Key Practice Points:**
- Using a medium tension at graft fixation is optimal in producing less anterior tibial displacement post-surgery.
- Literature shows anterior tibial displacement is not strongly correlated to patient function, however, this is the most commonly used outcome measure.
- More research needs to be undertaken to determine the ideal graft tension to produce an optimal functional outcome.

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**COMPARING BALANCE OUTCOMES OF ADDING A HOME-BASED EXERCISE PROGRAM TO A GROUP EXERCISE PROGRAM IN COMMUNITY THERAPY SERVICES**

Whitbourne C1, Koh Kwz2, Lawler K3, Cooke S1, Terkely R1, Hill K1,3

1Physiotherapy Department, Broadmeadows Health Service – Northern Health, Broadmeadows
2School of Physiotherapy, La Trobe University, Bundoora
3School of Physiotherapy, Curtin University, Bentley

**Question:** Does adding a home-based exercise program (HEP) to a standard group exercise program (GEP) improve balance outcomes better than a GEP in isolation for clients with balance impairments?

**Design:** Randomised-controlled trial.

**Participants:** Participants with balance impairments from Community Therapy Services at Broadmeadows Health Service.

**Intervention:** The intervention group received two home-based physiotherapy sessions to tailor a HEP in addition to usual care. The control-group only received usual care, including a one-hour weekly GEP over six-eight weeks.

**Outcome Measures:** Outcome measures included the Balance Outcome Measure for Elder Rehabilitation (BOOMER) score and force platform balance measures using the NeuroCom Balance Master®.

**Results:** Eleven participants in the control group and seven in the study group have completed three-month follow-up. Both groups were similar at baseline. Mann-Whitney U tests showed no significant differences between groups post-interventions; at three-month follow-up there was significant reduction in limits of stability reaction time for the intervention group compared to control group (p<0.008). One-way ANOVA with repeated measures showed significant within-groups post intervention BOOMER score improvement.

**Conclusion:** Results from preliminary analysis suggested that HEP combined with GEP is similar to GEP in isolation on improving short-term balance outcomes. Further studies are needed to identify the long-term benefits of adding a HEP to a usual GEP.

**Trial registration:** LR19/11.

**Key Practice Points:**
- Group-based exercise programs (usual care) and adding home-based exercises to usual care both improve balance outcomes.
- Adding home-based exercises to a group-based exercise program could improve long-term balance outcomes.
- Larger sample-size and further studies may determine long-term benefits of adding a home-based exercise program to usual care.

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**PATIENT AND PHYSIOTHERAPIST REPORTED ADHERENCE TO AIRWAY CLEARANCE THERAPY, INHALATIONS AND EXERCISE TOGETHER WITH LUNG FUNCTION OUTCOMES IN CYSTIC FIBROSIS**

Kotowicz E1, Holland A1, Burge A2, Ivulich S2, Ellis M2, Wilson J1,2, Button B1,2

1Physiotherapy, The Alfred Hospital, Melbourne
2Pharmacy, The Alfred Hospital, Melbourne
3Allmed, The Alfred Hospital, Melbourne

**Biography:** After graduating from a Bachelor of Arts/Bachelor of Science degree at Monash University, Erika Kotowicz completed her Bachelor of Physiotherapy with Honours in 2012 from Monash University, under the supervision of Brenda Button. She was awarded the year four highest aggregate honours mark for both the final year and across the three years of it’s duration, with recognition and a prize awarded from the Physiotherapy Research Foundation. She is now currently employed as a Grade 1 Physiotherapist at Alfred Health.

**Question:** Is a five-point scale useful to evaluate patient/physiotherapist reported adherence in the adult CF population? What is the rate of decline in FEV1 in this population relative to adherence in airway clearance therapy (ACT), inhalations (IT) and exercise (Exs)?

**Design:** Retrospective review conducted over three years.

**Participants:** A total of 151 (84males, 67females) of 206 eligible CF clinical patients.

**Outcome Measures:** A 5-point scale was used by patients and therapists to record adherence scores for ACT, IT and Exs, with scores of 3, 4 and 5 considered adherent, and 1 or 2 non-adherent. Annual change in FEV1 was also measured.

**Results:** The Median (IQR) for males vs. females for age was 36 (29-42) vs. 34 (29-43) years; FEV1 percent predicted 67 (45-87) vs. 55 (49-79); and BMI 24(22-25) vs. 21(20-23). There were strong positive correlations between patient and therapist reported adherence scores to ACT, IT and Exs, (r = 0.783, 0.634, 0.595; p<0.001). Change in FEV1 ranged from -15.95% to +5% with 40% of participants between +5 and -1%. Median change for all participants was -0.95% (-2.91 to 0.47, p<0.05). The largest rate of decline was associated with patient reports of non-adherence to exercise with the smallest seen in those who rated themselves as adherent.

**Conclusions:** This 5 point adherence scale may be a useful way to quantify adherence to therapy and requires further investigation and validation. The rate of decline of FEV1 was significantly lower with adherence to exercise, and a similar trend was seen for ACT.

**Key Practice Points:**
- A five-point adherence scale may be useful in quantifying patient/physiotherapist reported adherence to therapy in adult CF patients
- An adherence measure specific to this population needs to be validated
- The study demonstrates that adherence to therapy in the adult CF population may improve outcomes in lung function

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**COMBINED MULTIDISCIPLINARY EARLY INTERVENTION FOR PATIENTS WITH IMPAIRED CONSCIOUSNESS**

Seeto T1, Budden C1, Griffin E2, Kajewski H3, McPhail S4,5, Kuys S1,6

1Princess Alexandra Hospital, Brisbane
2Jacana Acquired Brain Injury Service, Brisbane
3Centre for Functioning and Health Research, Princess Alexandra Hospital, Brisbane
4Institute of Health and Biomedical Innovation and School of Public Health, Queensland University of Technology, Brisbane
5The Prince Charles Hospital, Queensland Health
6Griffith Health Institute, Griffith University, Gold Coast

**Questions:** Do those with impaired consciousness post acquired brain injury benefit from combined multidisciplinary early intervention? Can a combined multidisciplinary early intervention in an acute neurosciences ward be implemented feasibly?

**Design:** A prospective longitudinal cohort study with matched historical controls.
Participants: Participants included patients following severe brain injury with impaired consciousness admitted to the Neurosciences Unit at Princess Alexandra Hospital.

Intervention: Twice weekly, combined multidisciplinary intervention with a physiotherapist, occupational therapist and speech pathologist during 60-90 minute sessions in addition to usual care. Matched historical controls received usual care where disciplines delivered intervention in isolation as part of routine clinical practice.

Outcome Measures: Clinical outcome measures included Glasgow coma scale, mental status questionnaire, Royal Brisbane outcome measure for swallowing, coma recovery scale revised, the acquired brain injury physiotherapy assessment, clinical outcome variable scale and functional independence measure items. The number of treatment sessions across both groups was collated.

Results: Participants receiving the combined multidisciplinary intervention improved across all clinical outcomes (p<0.05). Treating therapists were able to implement multidisciplinary intervention while maintaining similar number of treatment sessions across both groups.

Conclusions: Participants receiving the multidisciplinary early intervention exhibited clinically and statistically improvements in consciousness, orientation, movement return, communication, and activities of daily living. These improvements indicate potential to participate in rehabilitation with impaired levels of consciousness early in the recovery period. The combined multidisciplinary model of service delivery appears feasible within the acute setting, allowing implementation of best practice guidelines within available resources.

Key Practice Points:
- Combined multidisciplinary rehabilitation can be implemented feasibly within an acute setting for those with impaired consciousness post acquired brain injury.
- Those with impaired consciousness can participate in combined multidisciplinary rehabilitation early in recovery.
- Following severe brain injury, improvements in consciousness, orientation, communication and motor recovery are possible.

EARLY APPLICATION OF PORTABLE PERONEAL ELECTRICAL STIMULATION FOLLOWING STROKE

S. Kuys1,2, J. Clarke3, C. Dilworth4, M. Lynch5

1Griffith Health Institute, Griffith University, Gold Coast, Queensland, Australia
2Allied Health Research Collaborative, The Prince Charles Hospital, Brisbane, Queensland, Australia
3St Andrew’s War Memorial Hospital, Brisbane, Queensland, Australia
4Rural Stroke Outreach Service, Brisbane, Queensland, Australia
5Australian Catholic University, Brisbane, Queensland, Australia

Question: Is the application of portable peroneal nerve electrical stimulation for foot drop following stroke feasible and effective early following stroke?

Design: Comparative pre-post intervention study.

Participants: Stroke survivors with foot drop following acute onset of stroke.

Intervention: Portable peroneal electrical stimulation device was applied as early as clinically possible and used at the discretion of the treating physiotherapist.

Outcome Measures: Gait speed, balance and endurance were measured on discharge from hospital.

Results: 53 stroke survivors (58% male, aged 64 SD12 years) participated in this study. By discharge, participants who used the device walked faster, 0.69 m/s (SD 0.4) compared to 0.49 m/s (SD 0.3), though this was not statistically significant (p=0.13) and had better balance. Balance Outcome Measure for Elder Rehabilitation score 12 (SD3) versus 9 (SD4) (p=0.027). There was no difference in distance walked in six minutes, though approximately half of the participants were unable to complete this.

Conclusion: Peroneal nerve electrical stimulation looks promising early following stroke; though clinicians reported time constraints a limiting factor. Further investigation is required to explore those most likely to benefit, optimal dose and effect on falls.

ARE EQUIPPED HOME-BASED PULMONARY REHABILITATION PROGRAMS SUPERIOR TO NON-EQUIPPED PROGRAMS FOR CLIENTS WITH SEVERE RESPIRATORY DISEASE? A SYSTEMATIC REVIEW

Kwiatkowski SL1,2, Morris N1, Kuys S3,4, Laakso L1

1Griffith University School of Rehabilitation Sciences, Southport
2Metro South Hospital and Health Service, Brisbane
3Metro North Hospital and Health Service, Brisbane

Question: Are externally paced walking programs or equipped exercise programs superior to self-paced walking programs for clients with severe respiratory disease undertaking home-based pulmonary rehabilitation?

Design: Systematic review with data from quantitative studies synthesised in a narrative format.

Participants: People with a severe respiratory disease (excluding cystic fibrosis) over 18 years, living at home and eligible to undertake home-based pulmonary rehabilitation in stable disease state or post-exacerbation.

Intervention: Home-based pulmonary rehabilitation programs of ≥6 weeks duration consisting of ≥90 minutes exercise training per week. Programs were either non-equipped (self-paced walking, externally-paced walking) or equipped (use of a treadmill or stationary cycle).

Outcome Measures: Common measures of exercise tolerance, dyspnoea, and quality of life were included.

Results: Nineteen trials were identified as meeting the inclusion criteria. With the exception of one study, all identified studies had small participant numbers, poor assessor blinding and poor reporting of intention-to-treat analysis and adverse events. There was insufficient data to perform meta-analysis. All program types demonstrated benefit in terms of exercise tolerance, dyspnoea and quality of life. A greater percentage increase in exercise tolerance from baseline was observed in studies with a higher training intensity.

Conclusions: All types of home-based pulmonary rehabilitation program demonstrated benefit in the outcomes of interest. The magnitude of benefit was greatest when exercise was prescribed at a higher intensity and sufficient duration. Reporting of prescribed exercise intensity was variable. Exercise intensity actually achieved was not reported.

Key Practice Points:
- All forms of home-based pulmonary rehabilitation are beneficial in terms of exercise tolerance, dyspnoea and quality of life.
- Programs prescribing exercise at higher intensity and duration demonstrated a greater magnitude of improvement in exercise tolerance.
- There was insufficient data to comment on which type of program promoted better adherence.

CHANGING MOVEMENT/MOTOR CONTROL PATTERNS USING BIOFEEDBACK WITH MOTION SENSOR TECHNOLOGY IN PEOPLE WITH BACK PAIN – A PILOT TRIAL

Laird R1, Kent P1, Haines T1

1Department of Physiotherapy, Monash University, Melbourne, Australia
2Spine Centre of Southern Denmark, University of Southern Denmark, Odense, Denmark

Question: Observation of movement and posture is a common component of physically examining people with low back pain (LBP). The aim of this pilot trial was to test the hypothesis that modifying patterns of painful lumbo-pelvic movement in people with back pain would lead to reduced pain and activity limitation when compared to standard care and placebo. Design & Participants: A multicentre, cluster randomized, placebo-controlled pilot trial compared two groups of people with low back pain (n=86).
Intervention: Group one received modification of movement patterns augmented by motion-sensor movement biofeedback (ViMove, dorsaVi). Group two received standard medical care and a placebo (wearing the motion-sensor device without feedback). Both groups received 6-8 treatment sessions.

Outcome Measures: Primary outcomes were pain intensity (QVAS 0–100 scale) and activity limitation (RMDQ, PSFS). Secondary outcomes included analgesic use, change in fear avoidance beliefs (FABQ), recurrence and movement limitation. Outcomes were measured on a weekly basis during treatment and at 12, 26 and 52 weeks follow-up. Result: An interim analysis, with 48 participants having completed the 6 month follow-up and 30 participants the 12 month follow-up, showed significant between-group differences favouring the biofeedback group for pain (linear mixed model coefficient (95% CI): -8.00 (-12.78, -3.21) 0-100 scale) and activity limitation (RMDQ: -1.64 (-2.90, -0.37) 0-24 scale, PSFS: 0.73 (0.01, 1.46) 0-10 scale).

Conclusions: These results indicate that modification of painful lumbo-pelvic movement produces superior reduction of pain, and improvement to activity limitation, in people with back pain when compared to standard care.

FALLS TRENDS WITHIN PHYSIOTHERAPY: A RETROSPECTIVE ANALYSIS

Lam J, Chapman S, Penberthy L, Tzerefos R
Northern Health, Melbourne

Questions: What happened when patients fell during physiotherapy?
Design: Retrospective observational descriptive study.
Participants: Patients who had falls while performing physiotherapy interventions with a physiotherapist during the period of October 2010 to September 2012 and were recorded in Victorian health information manage system (VHIMS).
Outcome Measures: Physiotherapy activity at time of fall, location, mechanism/cause of fall, primary and secondary contributing factors and possible minimising strategies were the outcome measures. Incident reports recorded on VHIMS from October 2010 to September 2012 were audited, and outcome measures of falls related to physiotherapy interventions were recorded.
Results: Thirty records of falls related to physiotherapy were identified. Most falls were reported by junior staff (50%) and occurred whilst the patient was mobilising, transferring, practicing steps or doing squats. 47% of falls occurred in subacute wards. 93% of falls occurred during individual physiotherapy interventions, only 7% falls occurred during group exercise setting. Sliding forward off sitting on edge of bed/chair/ wheelchair and knee/leg giving way were the most common cause/mechanism of falls. Fatigue was the main contributing factor. Main secondary contributing factors were lower limb weakness, behavioural component and impulsiveness. Possible minimizing factors reported by reporters were having a second person to assist, education of patient and staff, resting patient, closely supervising/monitoring patients and modifying task/intervention.
Conclusion: This study shows that performing functional activities and lower limb giving way are the main causes of falls occurring within physiotherapy. Patient fatigue appears to be a main contributing factor to falls during physiotherapy interventions. NH Ethics Approval: 16/13.

Key Practice Points:
• Monitor patient fatigue levels during physiotherapy interventions
• Take caution when treating patients with cognitive or behavioural issues one-on-one with functional activities, may need to consider a second person
• Need to improve junior staff’s clinical decision-making to minimise falls with physiotherapy intervention

RECRUITING PATIENTS TO LARGE CLINICAL TRIALS OF LOW BACK PAIN

Williams CM1, Maher CG2, Hancock MJ1, McAuley J1, Lin CW1, Latimer J2
1The George Institute for Global Health, Sydney
2Sydney Medical School, The University of Sydney, Camperdown
3School of Physiotherapy, Faculty of Human Sciences, Macquarie University, Ryde
4Neurosciences Research Australia, Randwick

Questions: What factors influence the rate primary care clinicians recruit participants to clinical trials in primary care?
Design: Prospective observational study.
Participants: Data were collected from 363 clinicians recruiting participants to a randomised controlled trial of low back pain.
Outcome Measures: Data were collected regarding the practice details, the socioeconomic status (SES) of the practice location determined using postcodes, the qualifications and years of practice of the clinician, and the amount and type of contact between clinical trial researchers and the clinician.

Results: 363 clinicians recruited 1,195 participants. This represented a rate of 0.013 participants per day per clinician with those located in a high socio-economic area recruiting at half the rate of those located in a low socio-economic area. Additionally, those clinicians receiving further contact from the clinical trial team within 2 weeks of the initial training and a greater number of face-to-face visits recruited a larger number of participants to the trial.

Conclusion: This study outlines trial procedures that are associated with increased recruitment of participants by primary care clinicians to trials evaluating management of low back pain. It appears that supporting clinicians through face to face contact and immediate follow-up are associated with successful recruitment while clinician characteristics such as gender, training and experience are of little consequence.

Key Practice Points:
- Fifty percent of trials require funding extension due to recruitment issues.
- Supported primary care clinicians and those operating from areas with a low socio-economic status have a higher recruitment rate than those operating in areas of high socio-economic status.
- The personal characteristics of the clinician are of little consequence.

ACCESSING SUPPORT THROUGH MEDICARE LOCALS TO ENGAGE WITH THE COMMONWEALTH GOVERNMENT’S EHEALTH INITIATIVES

Lausberg S1, Higgins C2

1Inner East Melbourne Medicare Local
2Victorian Branch Australian Physiotherapy Association

Questions: What interventions at the Medicare Local level support physiotherapists’ engagement with eHealth initiatives?

Aims: General practice has been the focus of support for computerisation and eHealth, yet allied health input into electronic health records provides important clinical information. The project sought to assist physiotherapists in transitioning from paper-based to computerised clinical notes, and to increase their engagement with EHealth initiatives. This work was undertaken to inform future support of allied health professionals’ engagement with the Commonwealth Government’s eHealth initiatives.

Design: Supported practice innovation.

Participants: Seventeen private physiotherapy practices, allocated into two groups; paper-based and computerised (defined by type of clinical notes system in use).

Intervention: The pilot included assistance to register for the personally controlled electronic health record system, support with choosing clinical software, vendor demonstrations, matrices of functionality and costs, and further support and online networking using online forum.

Outcome Measures: Participating practices would trial clinical notes software (paper-based group) or secure messaging and/or picture archiving communication system (computerised group).

Results: Registration to the electronic health record system was achieved for all practices. High levels of engagement were achieved with clinical notes software and picture archiving communication system as well as with the intra-professional networking opportunities available via the online forum. The practices in the computerised group rejected secure messaging due to low use by referring general practitioners.

Conclusion: Medicare Locals are well positioned to provide formalised support to physiotherapists’ engagement with eHealth initiatives. Online forums are perceived as particularly formalised supports to physiotherapists’ engagement with Medicare Locals are well positioned to provide practices in the computerised group rejected secure messaging and/or inter-professional communication system as well as with the intra-professional networking opportunities available via the online forum. The practices in the computerised group rejected secure messaging due to low use by referring general practitioners.

Key Practice Points:
- Therapy provided by carers may effectively augment that provided by physiotherapists.
- Further information is required to find out the training supervision required to enable carers to augment physiotherapy practice.
- Training carers to provide physiotherapy may impact on carer stress but there is little research available in this area.

PRIME: IMPROVING THE JOURNEY TO HIP AND JOINT ARTHROPLASTY FOR THE ELDERLY WITH CO-MORBIDITIES AND HIGHER RISK OF COMPLICATIONS

Leahy E1,2, Hill K1,3, Sunderland Y1, Smith R1,2, Kennett P1, Breheny T1, Tu A1, Lim K1,4

1Northern Health
2La Trobe University
3National Ageing Research Institute
4The University of Melbourne

Question: Do patients attending a new multidisciplinary “Proactive Intervention and Medical assessment in Elderly elective surgical patients” (PRIME) service prior to knee or hip arthroplasty have an improved pre and post-operative journey.

Design: Cohort study with matched historical controls.

Participants: The intervention group consisted of 30 patients (mean age 74.13) with significant co-morbidities who attended PRIME prior to a hip or knee joint arthroplasty. The historical control group consisted of 60 patients matched for procedure, gender and age.

Intervention: Patients from the intervention group had assessments and interventions performed and co-ordinated by a geriatrician, dietitian, nurse and physiotherapist.

Outcome Measures: Length of stay, number of complications, readmissions within 28 days; time from date waitlisted to surgery.
Results: Baseline comparisons between groups indicate that patients were well matched for age, surgery and gender. The PRIME intervention group had a significantly greater co-morbidity (p = 0.046). Post-operatively, there were no differences between groups in readmissions within 28 days, (p = 0.11) length of stay (p = 0.54) or number of complications (p > 0.05). The PRIME intervention group had a shorter time between notice of admission and surgery (p = 0.000), mean difference = 81.85 days, 95% CI 37.55 to 126.15.

Conclusion: Preliminary evidence indicates that elderly patients with a high co-morbidity index who attend PRIME clinic prior to joint arthroplasty have similar post-operative outcomes to age, gender and surgery matched patients who have a lower co-morbidity index. The PRIME service appears to be effective in reducing time to surgery.

Key Practice Points:
• An individualised, multidisciplinary, pre-operative assessment and intervention, which includes physiotherapy, may reduce the risk of post-operative complications and length of stay.

ERISITAS 21 UNMDG GROUP: COLLABORATIVE MILLENNIUM DEVELOPMENT GOALS PROJECT

Lees J
University of Melbourne

Introduction/background: The vision of the U21 Health Sciences MDG group is to facilitate the training of health sciences students by developing strategies to be used by academic institutes to increase MDG awareness and skills. The student committee proposed the development of a collaborative student project for the U21 universities to work with an invited partner university. This approach is seen as enhancing the achievement of the U21 Health Sciences UNMDG mission to increase awareness and work towards the improvement of the UNMDGs.

Objectives:
The project aims to ultimately establish a tri-regional project with development of partnerships with three universities outside of the U21 network. A three tiered approach includes; relationships between student groups for shared learning experiences; between academics to provide support for curriculum development; and a collaboratively ‘on the ground’ practical endeavour. Kathmandu University has been selected to establish the initial working partnership, which is scheduled to commence later in 2013. To achieve this, a review of evidence on current models of international collaboration, including the potential tensions between volunteerism and paternal voyeurism within this model are explored.

Issues/questions for investigation or ideas for discussion:
• How can students develop meaningful community engagement in a developing setting?
• What are the risks of paternal voyeurism in this project and how can these be avoided?

MINIMAL IMPORTANT DIFFERENCE IN SIX-MINUTE WALK DISTANCE AND INCREMENTAL SHUTTLE WALK DISTANCE IN NON-CYSTIC FIBROSIS BRONCHIECTASIS

Lee A1,2,3, Hill CJ1,4, Cecins N1,2, Jenkins S1,2, McDonald CF1,4, Burge AT1, Rautela L1, Stirling RG1, Thompson PJ1,2, Holland AE1,2
1Alfred Hospital
2University of Melbourne
3Institute for Breathing and Sleep
4Austin Health

Participants: Symptomatic participants with stable non-CF bronchiectasis of any aetiology with a modified medical research council dyspnoea score ≥ 1.

Intervention: Forty-two participants with a mean FEV1 70% predicted completed an 8-week supervised exercise program.

Outcomes: Exercise capacity was measured using the incremental shuttle walk distance and six-minute walk distance as a measure of exercise capacity reflect clinical benefit in non-cystic fibrosis bronchiectasis.

Results: The mean change in 6MWD in participants who reported themselves to be unchanged was 10m, compared to 36m (small change) and 45m (substantial change) (p = 0.01). For the ISWD, the mean change in participants who reported themselves to be unchanged was 33m, compared to 54m (small change) and 73m (substantial change) (p = 0.04). The anchor-based method defined the minimal important difference for 6MWD as 24.5m (AUC 0.758, 95% CI 0.197 to -0.069) and range of motion of the centre of mass (coronal plane) (p = 0.005; MD = 0.007; 95% CI 0.002 to 0.011), but were not detected in the non-concussed group for the same variables; gait velocity (p = 0.04); the mean change in participants who reported themselves to be unchanged was 10m, compared to 36m (small change) and 73m (substantial change) (p = 0.04).

Conclusion: The results of this study indicate that two clinically useful measures: gait velocity and range of motion of the centre of mass (coronal plane), are sensitive measures of dual-task related changes in concussed patients.

Key Practice Points:
• There is increasing interest in clinical practice in assessing the utility of persons to perform two tasks simultaneously, termed: dual-task assessment.
• Dual-task assessment has the potential to identify physical and cognitive deficits associated with a concussion.
• Clinical measures such as gait velocity during a dual-task assessment can differentiate concussed and non-concussed individuals.

IS THE DUAL-TASK PERFORMANCE PARADIGM A USEFUL ASSESSMENT METHOD FOR A SPORTS-RELATED CONCUSSION?

Lee H1,2,3, Sullivan SJ, Schneiders AG3
1Neuroscience Research Australia, Sydney
2University of New South Wales, Sydney
3Centre for Physiotherapy Research, School of Physiotherapy, University of Otago, Dunedin, New Zealand

Question: Is the use of the dual-task performance paradigm a useful assessment method for a sports related concussion?

Design: Systematic review with meta-analysis of case-control studies.

Participants: Individuals diagnosed with a Grade-2 concussion as defined by the American Academy of Neurology Practice Parameters, and their age and gender matched controls.

Intervention: A dual-task performance examination combining level gait with a concurrent neurocognitive task (Modified Mental Status Examination).

Outcome Measures: Spatial-temporal (gait velocity, stride length, and stride time) and biomechanical (range of motion of the centre of mass in the sagittal and coronal planes) gait variables.

Results: Ten studies representing a total sample of 168 concussed and 167 non-concussed participants met the inclusion criteria. Meta-analysis demonstrated that dual-task performance deficits were detected in the concussed group for gait velocity (p < 0.001; MD = -0.133; 95% CI -0.197 to -0.069) and range of motion of the centre of mass (coronal plane) (p = 0.005; MD = 0.007; 95% CI 0.002 to 0.011), but were not detected in the non-concussed group for the same variables; gait velocity (p = 0.04); the mean change in participants who reported themselves to be unchanged was 10m, compared to 36m (small change) and 73m (substantial change) (p = 0.04).
PRE-EMPLOYMENT FUNCTIONAL CAPACITY ASSESSMENTS PREDICT MUSCULOSKELETAL INJURY RISK IN HEALTHY MALE COAL MINE WORKERS

Legge J1,2, Burgess-Limerick R1,2, Peeters C3,4
1JobFit Systems International, Mackay
2School of Human Movement Studies, The University of Queensland, Brisbane
3Minerals Industry Safety and Health Centre, The University of Queensland, Brisbane
4School of Population Health, The University of Queensland, Brisbane

Questions: Do pre-employment functional assessments predict musculoskeletal injury risk in healthy male mine workers? Does the injury risk differ for injury type? Does the injury risk differ over time?
Design: Prospective observational study.
Participants: Six hundred healthy male coal mine workers who participated in a job-specific pre-employment functional assessment (PEFA) as part of the hiring process of an Australian coal mine.

Outcome Measures: At baseline, participants were screened with a job-specific JobFit System PEFA and scores were dichotomized into PEFA 1 if they met the job demands and PEFA >1 if they did not. Injury data was obtained from the company's database and injuries were classified according to body location, severity and mechanism.
Results: Of the 600 participants (median age 37 years, range 17.0 to 62.6 years, 427 (71%) met job demands (PEFA 1). The median follow-up time was 2 years (IQR 1.2 to 4.0). A total of 121 workers (20.2%) reported an injury and 29 workers (4.8%) reported a back injury associated with manual handling. Statistically significant differences were found between PEFA groups in time to injury over the longer term (>1.3 years) for all injury types: any injury (HR=3.3, CI 1.6 to 6.6), back injuries from (HR=5.8, CI 2.0 to 16.7).

Conclusion: The JobFit System PEFA predicts musculoskeletal injury risk in healthy male mine workers over the longer term.

Key Practice Points:
- Job-specific pre-employment assessments meet anti-discrimination legislation
- The JobFit System PEFA predicts musculoskeletal injury risk over the longer term, but not the short term
- More research is needed to identify why risk changes over time however, practitioners can maximize the opportunity of the period with physical conditioning and workplace modifications

THE IMPACT OF GROUP CIRCUIT TRAINING FOR BALANCE AND MOBILITY ON FALLS IN PEOPLE WITH MULTIPLE SCLEROSIS: A RANDOMISED CONTROLLED TRIAL

Lennon S1, Coulter E2, Garcia-Jalon E2, Hughes Cm2, Mcveigh J3, Kerr D3, Hawkins S1
1Flinders University, Adelaide, SA, Australia
2Glasgow Caledonian University, Glasgow, United Kingdom
3Queen's University, Belfast, United Kingdom
4University of Ulster, Belfast, United Kingdom

Question: What is the effect of group circuit training for balance and mobility on falls in people with Multiple Sclerosis?
Design: A randomised controlled trial with concealed allocation, assessor blinding and intention-to-treat analysis.
Participants: 177 people with any type of MS, who were able to walk independently for at least 10 meters.

Intervention: The experimental group completed a group exercise and education programme focused on balance and mobility twice a week for 6 weeks. The control group only received a weekly ten minute telephone call.

Outcome Measures: The primary outcome measure was the Rivermead Mobility Index. Secondary outcomes were the Berg Balance Scale, MS Walking Scale, Number of Falls, Near Falls Frequency and the 10m walking speed (m/s) completed before and after training, and at three and six months follow up.
Results: Falls were reported in 43.2% of the control group (n=38), and 58.4% of the exercise group (n=52). No differences were observed between groups on the number of falls (p=0.110). There were significantly less near falls in the exercise group (p=0.002). Significant differences were observed in favour of the exercise group for the Berg Balance Scale (p=0.004), MS Walking Scale (p<0.001), and walking speed (p<0.001) which were maintained at 3 months but not at 6 months follow up.
Conclusion: Six weeks of training improved balance, and mobility but did not change falls frequency.

Trial registration: ISRCTN78227711. Ethical approval: ORECNI-07/NIR01/S.
Funding: Public Health Agency (RDO) Northern Ireland.

Key Practice Points:
- Group circuit training can improve balance and mobility in people with MS
- Group circuit training needs to be repeated every 3 months to maintain gains in balance and mobility
- Specifically tailored falls management programmes need to be developed and tested in people with MS
THE MANAGEMENT OF SHOULDER INJURIES IN THE EMERGENCY DEPARTMENT

Lennon R

I will be co-presenting a 1.5-hour workshop at the APA conference week with Dr Tania Pizzuti. The workshop will be held between 1.30-3pm at the Melbourne convention centre on the 16th Oct 2013.

Background: In Australia, physiotherapists are being utilised in the Emergency Department (ED) to assess and manage acute musculoskeletal injuries. This is an important role to reduce the workload of the triage nurses and medical consultants. It requires a high level of skill and efficiency to assess and manage patients in this acute setting. The shoulder is a complex joint with a large variety of traumatic presentations. This workshop will provide physiotherapists with a detailed and systematic approach to assessing, diagnosing and managing acute shoulder injuries in the emergency setting. Up-to-date, evidence-based information from numerous sources including research papers, orthopaedic surgeons, sports physicians and expert shoulder physiotherapists will provide the support for the details presented.

Content: The workshop will cover the assessment and management of a variety of traumatic shoulder conditions that commonly present to the ED, including shoulder dislocations, acromioclavicular joint injuries, sternoclavicular joint injuries, acute neuropathies, a variety of fractures and rotator cuff tears. Each topic will be explored in detail, providing the various scenarios in which they can present. The most appropriate assessment strategy and treatment plan for each scenario will be explained and discussed, with a particular focus on making the correct diagnosis, being time efficient, and when to refer for radiography, a Doctor and a Specialist.

ELECTRICAL STIMULATION FOR CONTRACTURE MANAGEMENT AFTER ACQUIRED BRAIN INJURY: A RANDOMISED TRIAL

Leung J1,2, Harvey LA3, Moseley AM1,3, Tse C4, Bryant J5, Wyndham S5, Barry S6
1Royal Rehabilitation Centre Sydney, Sydney
2Sydney Medical School, University of Sydney, Sydney
3The George Institute for Global Health, Sydney
4Wanna Hostel, Anglican Retirement Villages, Castle Hill, Sydney
5Balmain Hospital, Sydney
6Brain Injury Rehabilitation Unit, Liverpool Hospital, Sydney

Question: Is electrical stimulation and splinting more effective than splinting alone for the management of wrist contracture following acquired brain injury?

Design: A single-centre randomised trial with concealed allocation, assessor blinding and intention-to-treat analysis.

Participants: Thirty-six adults with first stroke or traumatic brain injury and mild to moderate wrist flexion contractures.

Intervention: The experimental group received electrical stimulation to the wrist and finger extensor muscles for 1 hour a day over 4 weeks while the control group did not. Both groups wore a splint for 12 hours a day during this 4-week period.

Outcome Measures: The primary outcome was passive wrist extension measured with a 3 Nm torque and with the fingers in extension. Secondary outcomes included passive wrist extension, wrist and finger extensor strength, wrist flexor spasticity, motor control of the hand, and global perceived effect. Outcome measures were taken at baseline, at the end of the intervention period (4 weeks), and after a 2-week follow-up period (6 weeks).

Results: At 4 and 6 weeks, the mean between-group difference (95% CI) for passive wrist extension was 7 degrees (-2 to 15) and -3 degrees (-13 to 7), respectively. Secondary outcomes were statistically non-significant or were of borderline statistical significance.

Conclusion: It is not clear whether electrical stimulation and splinting is more effective than splinting alone for the management of wrist contracture after acquired brain injury.

Trial registration: ACTRN12609001495224.

Key practical points:
- Response to electrical stimulation varies.
- It may be reasonable to try electrical stimulation as it is inexpensive, well tolerated and not associated with harm.
- Clinicians may have to consider using a higher dose of electrical stimulation than that used in the study.

ACCEPTABILITY OF SHORT-FORM SUN-STYLE TAI CHI IN PEOPLE WITH COPD

Leung RW1, McKeough ZJ3, Peters MJ3, Alison JA2
1Department of Physiotherapy, Concord Hospital, Sydney
2Discipline of Physiotherapy, University of Sydney, Sydney
3Respiratory Medicine, Concord Hospital, Sydney

Question: Is short-form Sun-style Tai Chi an acceptable mode of exercise training in people with COPD?

Design: An observational study with assessor blinding.

Participants: Twenty-three participants (mean (SD) age 74 (8) years) with COPD (mean FEV1 % predicted 59 (17)%) who completed the 12-week short-form Sun-style Tai Chi training program.

Intervention: Participants completed a survey at the end of the 12-week Tai Chi program.

Outcome Measures: The survey included eight questions and each question was answered by putting a stroke on a 10 cm line with a higher score indicating a better experience (visual analogue scale). A blinded assessor scored the survey by measuring the distance from the left hand side of the line to the stroke.

Results: Results for four of the eight survey Questions:
1. ‘How enjoyable was the Tai Chi program?’ (mean (SD) score 8.9 cm (1));
2. ‘How helpful was the Tai Chi program in improving physical fitness (7.9 cm (2)), balance (7.9 cm (2)) and shortness of breath (7.0 cm (2)).’
3. ‘How hard was it to remember the Tai Chi movements?’ (5.3 cm (3)) 4.‘Would you continue Tai Chi training as your regular exercise regimen?’ (8.4 cm (2)).

Conclusion: Participants reported that short-form Sun-style Tai Chi was an enjoyable exercise which improved their physical fitness, balance and shortness of breath. Although the Tai Chi movements were not easy to remember, participants indicated that they would continue Tai Chi as their regular exercise regimen.

Trial registration: ACTRN12608000393369.

Key Practice Point
- This is the first study examining the acceptability of short-form Sun-style Tai Chi in people with COPD.

DOES SHORT-FORM SUN STYLE TAI CHI IMPROVE EXERCISE CAPACITY IN PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)? A SINGLE-BLIND, RANDOMISED CONTROLLED TRIAL

Leung RW1,3, McKeough ZJ2, Peters MJ3, Alison JA2
1Department of Physiotherapy, Concord Hospital, Sydney
2Discipline of Physiotherapy, University of Sydney, Sydney
3Respiratory Medicine, Concord Hospital, Sydney

Question: What is the effect of short-form Sun-style Tai Chi on exercise capacity, balance and health-related quality of life in people with COPD?

Design: Randomised controlled trial with concealed allocation, assessor blinding and intention-to-treat analysis.

Participants: Forty-two participants (mean (SD) age 73 (8) years) with COPD (mean FEV1 % predicted 59 (15)%). Four patients (mean (SD) age 73 (10)%). Four patients (mean (SD) age 73 (10)%). Four patients (mean (SD) age 73 (10)%). Four patients (mean (SD) age 73 (10)%).

Intervention: People in the experimental group completed a 12-week, twice weekly short-form Sun-style Tai Chi training program at a moderate level of dyspnoea or exertion (score = 3 in a 10 point scale). The control group had usual medical care.

Outcome Measures: The primary outcome was endurance shuttle walk test (ESWT) time. The secondary outcome measures were incremental shuttle walk test (ISWT) distance, balance measured by medial-lateral body sway and quality of life measured by the chronic respiratory disease questionnaire (CRQ). Measures were taken at baseline and at the end of the 12 week study period. Data were analysed using repeated measures ANOVA.
Results: Compared to control, Sun-style Tai Chi significantly increased ESWT time (mean difference, 95% CI: 384 s, 186 to 510) and ISWT distance (55 m, 31 to 80); reduced medial-lateral body sway in semi-tandem stand (12 mm, -21 to -3); and increased total score on the CRQ (11 points, 4 to 18).

Conclusion: Short-form Sun-style Tai Chi was an effective training modality that improved exercise capacity, balance and quality of life in people with COPD.

Key Practice Point
• This is the first randomised controlled trial examining the effects of Sun-style Tai Chi in people with COPD
• Tai Chi improved exercise capacity, balance and health-related quality of life in people with COPD
• Sun-style Tai Chi could be considered as a training mode for people with COPD

SEDEDNTARY BEHAVIOURS IN ADULTS WITH AND WITHOUT CHRONIC DISEASE: HOW MUCH TIME IS SPENT AND WHAT ARE THEY DOING?

Lewis LK1,2,1, Hunt T1, Williams MT1, English C1,3,4, Olds T1
1Health and Use of Time (HUT) Group, University of South Australia, Adelaide
2School of Population Health, University of South Australia, Adelaide
3International Centre for Allied Health Evidence, University of South Australia, Adelaide
4Stroke Division, Florey Institute of Neuroscience and Mental Health, Melbourne

Questions: During waking hours, how much time do older adults with and without chronic disease spend in sedentary behaviours and what types of behaviours are they engaging in?

Design: Observational cross-sectional study.

Participants: This study was conducted in two cohorts: people with clinically stable chronic obstructive pulmonary disease (n = 24) and their spousal carers (n = 24), and community dwelling stroke survivors (n = 24) and age and gender matched healthy adults (n = 24).

Outcome Measures: All participants were monitored over six days (Actigraph GT3X+ accelerometer; SenseWear Pro3 armband). During this time, a 24-hour time recall instrument was administered by computer-assisted telephone interview. Sedentary behaviour was quantified and categorised using both Actigraph and recall data.

Results: The healthy group had the lowest sedentary time estimated by accelerometer (45% of waking hours), followed by the stroke (54%), stroke (60%) and chronic obstructive pulmonary disease (62%) groups (p < 0.001). People with chronic obstructive pulmonary disease and stroke spent more time sitting than healthy people (p = 0.03). The healthy group spent almost one hour more per day on the computer than either the stroke or chronic obstructive pulmonary disease groups. Level of physiological impairment (FEV1 % predicted for the chronic obstructive pulmonary disease and carer groups, and walking speed for the stroke and healthy groups) independently predicted percentage of waking time sitting (p = 0.001).

Conclusion: People with chronic obstructive pulmonary disease and stroke survivors spent significantly more time engaged in sedentary behaviours than carers or healthy adults.

Key Practice Points:
• Both duration of sedentary activity and the pattern of accumulation have been linked to adverse health outcomes and mortality.
• This study explored sedentary behaviour at the macro (duration) and the micro (type and context) level.
• The findings have implications for interventions aimed at reducing sedentary behaviours.

DIMISHING EFFECT SIZES WITH REPEATED EXPOSURE TO EVIDENCE BASED PRACTICE TRAINING IN HEALTH PROFESSIONAL UNDERGRADUATES

Lewis LK1, Wong SC1, Wiles LK1, McEvoy MP1,2
1Health and Use of Time (HUT) Group, University of South Australia, Adelaide
2International Centre of Allied Health Evidence (iCAHE), University of South Australia, Adelaide

Question: What is the magnitude of change in outcomes following repeated exposure to evidence based practice training in health professional students?

Design: Longitudinal pre-post design.

Participants: Seventy-eight entry-level students from the University of South Australia (n = 46 physiotherapy, 22 medical radiation, 5 human movement, 4 health science, 1 podiatry).

Intervention: Two sequential evidence based practice theory courses (13 weeks each) delivered to entry-level students. The first course aimed to develop foundation knowledge and skills of the five steps of evidence based practice and the second course aimed to teach students application of the steps.

Outcome Measures: Two pre-existing instruments were used to collect self-reported (knowledge, confidence, practice, relevance, sympathy, confidence) and objective (actual knowledge) data. Participants completed both instruments before and after the two courses. Effect sizes were classified as negligible (-0.15 to 0.14), small (0.15 to 0.39), medium (0.40 to 0.74), large (0.75 to 1.09), very large (1.10 to 1.44) and huge (>1.45).

Results: Effect sizes were greater after the first course compared to after the second course for relevance (0.72, 0.26), practice (1.23, 1.12), self-reported knowledge (2.73, 0.84) and actual knowledge (1.92, 1.45). The change was greater after the second course for sympathy (0.03, 0.14) and confidence (0.51, 1.45).

Conclusion: Effect sizes were larger for the outcomes of knowledge, relevance and practice for people with minimal prior exposure to evidence based practice concepts. Changes in participants’ confidence and sense of compatibility with professional work (sympathy) required a longer timeframe and repeated exposure to training.

Key Practice Points:
• The effect of entry-level evidence based practice training changes with repeated exposure
• Primary training should focus on teaching foundation knowledge and skills
• Subsequent training could become more clinically integrated to allow for improvement in attitudes and confidence

EFFECTS OF PHYSICAL ACTIVITY AND EXERCISE IN BREAST CANCER PATIENTS RECEIVING ADJUVANT THERAPY: A SYSTEMATIC REVIEW

Li M1, Briffa K1
1School of Physiotherapy, Curtin University of Technology

Mingjuan has eight years of experience in both private and public sector in Singapore. Her great passion for the profession led her to pursue her Masters in Clinical Physiotherapy (Continence and Women’s Health) in Curtin University of Technology, Western Australia. Her interest in oncology further led her to research about breast cancer patients during the course of study. She is also one of the few Vodder-Certified Manual Lymphatic Drainage therapists and Combined Decongestive Therapy therapists in Singapore. This specialised technique is recognised worldwide for the management of lymphoedema. The knowledge she had attained from these specialised courses equipped her with the advanced knowledge to manage clients with complex conditions.

Question: What are the effects of physical activity and exercise in breast cancer patients receiving adjuvant therapy?

Design: Systematic review of randomised and non-randomised controlled trials.

Participants: Participants diagnosed with breast cancer Stages I, II or III and receiving adjuvant therapy such as chemotherapy, hormonal therapy, radiation therapy or a combination of treatments.
Physiotherapists should consider treating children as a subset in
potentially assessed by physiotherapists to identify those who are
to determine the prognostic validity of the proposed factors.
These data can inform future research studies.

Conclusion:

Physiotherapists should screen for severe trauma, genetic
potentially assessed by physiotherapists to identify those who are
to determine the prognostic validity of the proposed factors.
These data can inform future research studies.

Conclusion: There is a lack of strong evidence to suggest the
effectiveness of exercise in managing the side effects of adjuvant
therapy. However, considering the minimal reporting of adverse
effects of exercise and the positive trends towards reducing
fatigue, better quality of life and improving psychological status in
exercise groups, exercise interventions should still be incorporated
into the treatment programme for breast cancer patients receiving
adjuvant therapy.

Key Practice Points:
• Due to minimal reporting of adverse effects, exercise should be
  prescribed for breast cancer patients.
• Note the possibility of undesirable effects during maximal
  exercise testing and exercise interventions.
• Future studies to consider investigating the effects of common
  physical activities for breast cancer instead of prescribing only
  structured intervention programmes.

MUSCULOSKELETAL PHYSIOTHERAPISTS PERCEPTIONS OF NON-RESPONSIVENESS TO TREATMENT FOR CERVICOCGENIC HEADACHE

Liebert A, Rebbeck T, Elias S, Hawkins D, Adams R
University of Sydney, Faculty of Health Sciences, Discipline of Physiotherapy

Questions: Cervicogenic headache (CH) is a debilitating problem
presenting in physiotherapy practice, with prevalence estimated
to be 13-17% of the population with chronic headache. An
estimated 25% of CH patients are non-responsive to conventional
therapy. How can researchers predict non-responsiveness,
since they have been unable to do so to date? Adopting an
approach that knowledge stores of experienced musculoskeletal
physiotherapists represent a resource, the purpose of the present
study was to obtain and examine their perceptions regarding factors
associated with non-responsiveness in CH treatment.

Design: An observational study.

Participants: A survey of 90 experienced musculoskeletal
physiotherapists (response rate 74%) was conducted to obtain
the factors that treating clinicians perceived as influencing non-
responsiveness in CH treatment.

Outcome Measures: Both written responses listing perceived
associated factors and ratings of factors for degree of association
on a 0 to 100 scale.

Results: Factors scored as the most related to unresponsiveness
were: history of severe trauma (M 60, SD 27), genetic history of
CH (M 55, SD 24), immunological co-morbidities (M 51, SD 26)
and neural sensitivity (M 49, SD 21). The same features were
considered to be associated with CH in children, but with children
not having the same unresponsiveness to treatment as adults.

Conclusion: These data can informs future research studies
to determine the prognostic validity of the proposed factors.

Key Practice Points:
• Physiotherapists should screen for severe trauma, genetic
  history, immunological comorbidities in CH
• Physiotherapists should consider treat children as a s subset in
  CH
• Some of these factors for example co morbidity factors could be
  inform appropriate management.

AN AUSTRALIAN CONSENSUS STATEMENT: EXERCISE FOR ANKYLOSING SPONDYLITIS

Millner JR, Barron J, Beinke K, Butterworth R, Chasle
B, Dutton C, Lewington M, Lim E, Morley T, O’Reilly P,
Pickering K, Telford J
• Menzies Research Institute, Hobart
• Eastwood Physiotherapy, Adelaide
• Adelaide West Pilates Physiotherapy, Adelaide
• BJC Health, Sydney
• S-E Sydney Area Health Service, Sydney
• Royal Perth Hospital, Perth
• Hydrohealth, Brisbane
• Physio Plus, Ballina/Lismore
• Melbourne
• Curtin University, Perth

Question: What recommendations can be made to guide exercise
prescription for people with ankylosing spondylitis in Australia?

Design: A writing group comprising eleven Physiotherapists from
six states participated in discussion rounds, using a modified
Delphi process. Eight key topics were identified, and a systematic
review performed for each. Experimental papers were individually
reviewed by group members using a research-based matrix format
to assess for: internal/external validity (Physiotherapy Evidence
Database score); relevance to the key topic area and the Australian
setting; reproducibility of the intervention and, where possible,
effect size.

Participants: Adults with ankylosing spondylitis according to
modified New York criteria.

Intervention: The definition of exercise was physical activity
involving voluntary body movement and/or muscle contraction
for the purpose of improving individual outcomes in ankylosing
spondylitis.

Outcome Measures: Validated measures for pain, axial mobility
and physical function in ankylosing spondylitis.

Results: A total of 202 papers were allocated to the key topic
areas, the majority being surveys, cohort and case-controlled
studies. Effect sizes were calculated for 20 randomised controlled
trials, the range being 0.12 - 4.9G. This information was combined
with the structured descriptive reviews and writing group opinion
inform to exercise recommendations for the following areas:
assessment/evaluation; monitoring of exercise prescription;
safety; biological therapy; ankylosing spondylitis-specific exercise;
physical activity levels; setting; dosage and compliance.

Conclusions: Although insufficient evidence was found to
recommend one type of exercise over another, the group
concluded that other factors, such as safety, dosage and
compliance were of equal importance.

Key Practice Points:
• Different levels of evidence may be relevant to different aspects
  of a clinical question,
• In addition to exercise type, safety, dosage and
  compliance are also key aspects of exercise prescription in
  ankylosing spondylitis.
• Additional high quality evidence is needed to clarify these areas.

“MY BACK ON TRACK, MY FUTURE”: DEVELOPING STORY BASED PATIENT INFORMATION FOR ABORIGINAL PEOPLE WITH LOW BACK PAIN

Lin P, Ryder K, O’Sullivan P, Coffin J, Gray D, Dalgety E,
Green C, Scott T, Lyons M

1Combined Universities Centre for Rural Health, the University of Western Australia
2Geraldton Regional Aboriginal Medical Service
3School of Physiotherapy, Curtin University
4Kaalowi Aboriginal Consultancy & Training

Question: what frameworks and processes can be used to develop
culturally secure information for Aboriginal people with low
back pain?

Design: Reflective account of project framework and processes.

Participants: Aboriginal and non-Aboriginal project staff,
mentors and Aboriginal steering group members.
Intervention: development of low back pain information was informed by five frameworks; i) cultural security - that ensures that the cultural rights of Aboriginal people are upheld and promoted, the project incorporates an Aboriginal cultural lens, and there is involvement of Aboriginal people at all stages, ii) story based/narrative approaches suited to Aboriginal styles of learning, iii) our previous research conclusions that disabling low back pain was potentially exacerbated by misinformed LBP beliefs and the multidimensional impact of the condition, iv) Bandura's theory of self-efficacy, and v) that information must be "sticky".

Results: five filmed scenarios were developed to illustrate information for Aboriginal people with low back pain.

Conclusion: Providing information to patients with low back pain that is culturally secure is an essential part of care and recommended by clinical guidelines. This project describes the frameworks and processes used to develop low back pain information suitable for the needs of Aboriginal people with low back pain in regional/remote Western Australia. This is relevant for the development of patient information for Aboriginal people with other interconditions or developing health information for other populations. A trial is currently underway comparing this information against alternative, more traditional, forms of low back pain information.

Key Practice Points:
1. Clinical guidelines recommend providing low back pain information to patients that is culturally appropriate.
2. Having frameworks to guide the process of developing patient information potentially improves quality.
3. This approach has implications for developing patient information for Aboriginal people with other health conditions or in other populations.

"HE JUST TELLS ME STRAIGHT UP": PERCEPTIONS OF ABORIGINAL PEOPLE WITH CHRONIC LOW BACK PAIN ABOUT COMMUNICATION WITH HEALTH CARE PRACTITIONERS

Lin I1,2, Sullivan P3, Coffin J1, Straker L1, Mak D1, Toussaint S1
1Combined Universities Centre for Rural Health, Geraldton
2Curtin University, Perth
3Geraldton Regional Aboriginal Medical Service, Geraldton

Question: What are the barriers and ways in which interpersonal communication with health care practitioners could be improved from the perspective of Aboriginal people with chronic low back pain?

Design: Qualitative study employing culturally secure methods within a clinical ethnographic framework.

Participants: Thirty-two Aboriginal people (21 men, 11 women) within a clinical ethnographic framework.

Outcome Measures: Thematic analysis identified barriers and enablers to communication.

Results: Communication was fundamental to developing a positive relationship with health care practitioners. Barriers to communication included miscommunications (e.g. unsatisfactory explanation about pain, not being listened to), an absence of communication and the use of medical jargon. Enablers were two-way communication between Aboriginal participant and health care practitioner, being “straight up” (akin to begin direct or honest) and a “yarning” communication style.

Conclusion: Interpersonal communication could be improved by attending to both communication content and style. Content aspects rely on accurate interpretation of a condition, honestly informing the patient about the cause of pain and what they can do to help themselves. This requires health care practitioners with up-to-date knowledge of low back pain. Patient centred communication styles which are a dialogue between patient and health care practitioner are valued. Yarning, a conversational style of communication used by Aboriginal people, may be a useful framework to guide the style of communication in clinical consultations.

Key Practice Points:
1. Communication is fundamental to successful low back pain care.
2. Communication with Aboriginal people with chronic low back pain can be improved by attending to the content and style.
3. Further work is underway to describe “clinical yarning” as a framework to guide the style of communication in clinical consultations.

RELIABILITY OF CERVICAL SPINE PASSIVE PHYSIOLOGICAL INTERVERTEBRAL MOVEMENTS: A PROTOCOL FOR EVALUATING RELIABILITY USING 3-D MOTION ANALYSIS

Lindsay R1, Leaver A1, Crosbie J2, Rebbeck T1, Shirley D1
1Faculty of Health Sciences, The University of Sydney, Sydney
2School of Science and Health, The University of Western Sydney, Sydney

Question: Can physiotherapists make reliable judgements about tissue resistance using passive physiological intervertebral movements (PPIVMs)?

Design: Pilot of a reliability study using a novel method of evaluating PPIVMs.

Participants: Ten health volunteers without neck pain.

Methods: Three manipulative physiotherapists, assessed C2/3 right rotation PPIVM on two occasions for each participant. During each technique, the assessors nominated the position of the points “R1” and “R2” as described by Maitland. Repeated measures of “R1” and “R2” were obtained by oscillating the movement between these points for ten repetitions. Three-dimensional motion analysis was used to record these nominated points and comparisons were made between assessors and between occasions. Motion analysis data enabled tracking of the movement of the participant’s head relative to their trunk, providing accurate measures of whole neck rotation during the assessment technique. Intra-rater reliability of the therapists’ judgements about the location of points “R1” and “R2” was evaluated using intraclass correlation coefficients. Consistency between assessors was reported using descriptive statistics.

Results: Intra-rater reliability was good for judgements of the location of both R1 (ICC range 0.44 to 0.81) and R2 (ICC range 0.73 to 0.90). There was close agreement between two of the three assessors regarding the location in range of points R1 and R2 for C2/3 PPIVM, with third assessor locating these points up to 13° further into rotation range (p<0.001).

Conclusions: Evaluating the reliability of judgement of tissue resistance with cervical spine PPIVMs is feasible with this protocol.

Key Practice Points:
1. The ability of physiotherapists to detect abnormalities of motion during commonly performed techniques such a passive physiological intervertebral movements had not been well established.
2. This study pilots a novel protocol for establishing the reliability of traditional physiotherapy descriptors of resistance to intervertebral motion.

THE NEW SOUTH WALES ALLIED HEALTH WORKPLACE LEARNING STUDY: BARRIERS AND ENABLERS TO LEARNING IN THE WORKPLACE

Lloyd B1, Pfeiffer D1, Dominish J1, Heading G2, Schmidt D1, McCluskey A1
1Centre for Education and Workforce Development, NSW Health, NSW
2Health Education and Training Institute, NSW Health, NSW
3Faculty of Health Sciences, The University of Sydney, Sydney

Background: Workplace learning refers to continuing professional development that is stimulated by and occurs through participation in everyday activities within the workplace.

Question: What are the barriers to and enablers of workplace learning for allied health professionals within NSW Health?

Methods: A qualitative study was conducted, with participants (n=10) allied health professions (including nine physiotherapists). The sample included 19 managers, 19 clinicians and eight educators from rural and metropolitan sites. Seven semi-structured interviews and nine focus groups were audio-recorded and transcribed. The ‘framework approach’ was used to guide the interviews and analysis. Textual data were coded and charted using an evolving thematic framework. Key themes for barriers to and enablers of workplace learning were identified.
DOES PASSIVE SPINAL MOBILIZATION IMPROVE HIP FLEXORS STRENGTH? A PILOT STUDY

Lo CN1, Cheung CK2, Cheung PC3, Chiu TW3
1School of Physiotherapy, University of South Australia, Adelaide, Australia
2Department of Rehabilitation Sciences, Hong Kong Polytechnic University, Hong Kong
3Department of Rehabilitation Sciences, Hong Kong Polytechnic University, Hong Kong

Objective: Muscles inhibition is a newly investigated topic, several causes have been proposed, which included pain, joints mechanics, sensory and spinal dysfunction. Clinically, various lower limbs problems are associated with hip flexors weakness, hip flexor inhibition is common in general. The purpose of this study is to assess if lumbar mobilization reduces hip flexors muscle inhibition.

Design: Randomized controlled trial with blinded assessor.

Participants: 42 participants without active hip and back pain were examined for hip flexors inhibition. 24 participants were qualified for the procedures. Randomization was done to allocate participants into experimental group and control group.

Intervention: Handheld dynamometer was used to measure the hip flexors strength before and after a lumbar spine L1–2 joint mobilization (experimental group) or a placebo treatment (control group).

Outcome Measures: The strength data collected were analyzed to calculate intratester reliability, and to compare between two groups.

Results: Excellent intratester reliability of the hip flexors strength, which was statistically significant (p < 0.001). Difference in hip flexors strength and torque after the intervention was not significant (p=0.390) between two groups. The percentage change in torque, compared with baseline, was significantly higher (p < 0.001) in the experimental group.

Conclusions: The results suggest that passive mobilization on L1–2 can increase the strength of hip flexors for non-low back pain people who present weakness in manual muscle testing.

Key Practice Points:
• Passive mobilization on L1–2 can improve the hip flexors strength.
• Muscle strength test on hip flexors should consider as a routine test for patients with low-gamotor problems.

THE CHILD WITH UNILATERAL WEAKNESS: DOPAMINE RESPONSIVE DYSTONIA IN DISGUISE – A FAMILY CASE STUDY

Locke M
Movement Solutions Physiotherapy

Introduction: Health professionals are often asked to assess a child’s gross motor milestones, lower limb alignment and general strength and skills. Physiotherapists, occupational therapists and podiatrists as direct access practitioners commonly see these children. The federal government has initiated the Healthy Kid’s Check that may be undertaken by a medical practitioner, practice nurse or Aboriginal health worker on 4-year old children. Purpose/objectives: Knowledge of the many causes of atypical gait and movement is important when screening the young child to ensure best diagnosis and management. In recent years, DRD’s are being more readily diagnosed. Treatment of these conditions significantly reverses the symptoms of the dystonia and allows children to actively participate in their community. Issues/questions for investigation or ideas for discussion: The clinical presentation of such children is subtle. This PeArLs will introduce the concept of using Kid’s Check that may be used to assess the child’s gross motor milestones, lower limb alignment and general strength and skills. Physiotherapy practitioners must have up to date knowledge of emerging neurological conditions, ensuring best practice.

SUPERVISING STUDENTS WITH FITNESS TO PRACTICE ISSUES – HOW DO WE SUPPORT CLINICIANS MORE EFFECTIVELY?

Lo K1, Curtis H2, Keating J1, Bearman M2
1Monash University
2Alfred Health

Introduction/background: Fitness to Practice (FTP) has three components: freedom from impairment (mental and physical), professional conduct and clinical competence. Our work indicates that health professionals can feel distress and challenges to personal wellbeing when students have FTP issues; 83% of educators report that student FTP issues affect their work satisfaction due to time pressures, lack of appreciation and quality of care conflict. With current demands on the healthcare system and workforce shortages, FTP strategies that optimise health professionals’ wellbeing and work satisfaction may contribute to maintaining a happy and adequate workforce. One strategy shown to improve clinician wellbeing is mindfulness, the quality of being attentive to the present moment.

Objectives:
• Review evidence regarding the importance and implications of FTP
• Discuss strategies that support clinical educators wellbeing / work satisfaction.
• Participate in a guided mindfulness session
• Create support networks between physiotherapy professionals

Issues/questions for investigation or ideas for discussion:
• What strategies support clinical educators managing students with FTP issues?
• How can we create a culture that is supportive of clinician wellbeing?
• What can I do in my daily practice to support my wellbeing?
EVALUATING PAEDIATRIC CONTENT WITHIN THE MASTERS OF PHYSIOTHERAPY PROGRAMME AT GRIFFITH UNIVERSITY – A BLUE PRINT FOR 2013 ONWARDS

Locke M1, Laakso L1
1School of Rehabilitation Sciences, Griffith University, Gold Coast

Introduction/background: Surveys of exiting students and first year graduates have highlighted paediatrics (specifically babies and infants) as an area that graduates feel underprepared to tackle in their first year. The adoption of a six semester Master of Physiotherapy at Griffith University provided an opportunity to review the existing curriculum and paediatric content. Historically, the paediatric content has been embedded as part of a lifespan stream within core courses covering musculoskeletal, neurological and cardiorespiratory physiotherapy. Purpose/objectives and Method: A mixed methods, iterative approach was developed to understand if the ideal pedagogical approach was being utilised; and whether curriculum content was contemporary, relevant and adequate for preparing physiotherapists. Over the past 12 months a specialist paediatric physiotherapist with a strong clinical focus has evaluated the program content in consultation with teaching staff. Outcomes: Contemporary teaching methods such as simulated learning experiences have been added to the course. A virtual paediatric folder for students’ reference is in development and considered a useful resource for paediatric coursework and clinical placements. Paediatric content will continue to be taught across the program, embracing the role of physiotherapy across the lifespan (rather than as a stand alone unit); and allowing greater flexibility for clinical placement allocation across the program. The use of specialist paediatric clinical presenters continues in the students’ final year to build on the foundation principles of first year. Graduate and employer evaluations will be the litmus test of the success of the project.

Key Practice Points:
- Paediatric physiotherapy knowledge is considered requisite for the graduating physiotherapist.
- Curriculum content for Paediatric physiotherapy requires review and updating in the same way as other areas of physiotherapy curricula.

THE EYES LEAD THE BODY: VISUAL ERGONOMICS FOR MODERN COMPUTER WORKSTATIONS

Long J

Many modern computer workstations have multiple monitors and different size displays. The introduction of this technology into workplaces has progressed more quickly than standards and guidelines have developed, so it is sometimes difficult to source up-to-date information about optimal display location and viewing distances. What advice should be given to clients who have more than one computer monitor at their workstation to ensure that they are comfortable? Should advice be different for younger and older age workers? This presentation will review the current evidence for arranging multiple monitors at workstations and offer practical tips to assist your clients achieve physical and visual comfort when using this technology.

EVIDENCE FOR THE USE OF ELASTIC RESISTANCE BANDS FOR SHOULDER REHABILITATION

Long S
James Cook University, Townsville

Biography: Sarah Long is a fourth year physiotherapy student undertaking her honours project at James Cook University under the supervision of Helen Land.

Question: What is the current evidence and protocols, including the number of repetitions per session and week, timeframe and progression of exercises, for the use of elastic resistance bands for rehabilitation of patients with shoulder conditions?

Design: A systematic review of intervention studies.

Participants: People with a shoulder complex condition.

Intervention: Resistance band exercises for the shoulder used in isolation, except for stretches, for at least one intervention group. Resistance bands were defined as graduated, coloured bands, either flat or tubular.

Outcome Measures: Type and duration of intervention, number of repetitions per set and per week, and outcome measures reported from studies identified.

Results: Four studies of low to moderate quality were identified. The results provided evidence towards improvement of pain, function and strength when using resistance bands as all studies had statistically significant differences in these outcome measures. The most common protocol was three sets of ten, either daily or three times a week, for six weeks. However the protocols provided were not comprehensively reported and lacked information such as resistance level, the varied protocols between participants, and progression of exercises.

Conclusion: Further high quality research is required with in-depth and comparative protocols to determine the optimal exercise is required. Resistance band exercises used in conjunction with other mediums in comparison to stand alone treatment also needs to be investigated.

FEASIBILITY AND CHALLENGES OF EARLY INTERVENTION PROGRAMS FOR INFANTS WHO HAVE CONGENITAL HEART DISEASE

Long SH, Eldridge BJ, Cheung M
1Heart Research Group, Murdoch Children's Research Institute, Melbourne
2Physiotherapy Department, Royal Children's Hospital, Melbourne
3Physiotherapy, Melbourne School of Health Sciences, University of Melbourne, Melbourne
4Department of Cardiology, Royal Children's Hospital, Melbourne
5Department of Paediatrics, University of Melbourne, Melbourne

Question: Does a hospital-based physiotherapy early intervention (EI) programme improve the gross motor development of infants who undergo early cardiac surgery?

Design: Prospective cohort with historical control.

Participants: Neonates who underwent elective or emergency cardiac surgery at >28 days of age at the Royal Children's Hospital, Melbourne.

Intervention: Infants who underwent palliative cardiac surgery were invited to participate in ‘Intervention A’ between 3 and 8 months of age, a physiotherapy programme aimed at correcting motor delays and musculoskeletal impairments. Infants who had corrective surgery were invited to participate in Intervention B, an educational session for primary caregivers, at approximately 3 months of age.

Outcome Measures: Alberta Infant Motor Scale performance at 8 months of age. Secondary measures included an audit of service provision and participation.

Results: Study recruitment was stopped prematurely. The available sample, recruitment rate, and survival rate were lower than anticipated. Cardiac, respiratory and neurological complications led to lengthy admissions limiting our ability to recruit participants, and limiting the ability of those recruited to receive intervention at the planned frequency and intensity. Unpredictable barriers arising from family and service providers, including illness, workload, staffing changes, unexpected medical events, geographical constraints, and the perceived importance of therapy, contributed to limited participation in EI.

Conclusions: Although closely monitored physiotherapy services were offered to study participants, families’ take-up of services was limited. It is unfeasible to evaluate the effectiveness of intervention services for the available cohort of infants with a hospital-based physiotherapy programme.
POSTURAL CONTROL IN VERY PRETERM COMPARED WITH TERM PRESCHOOL AGE CHILDREN

Lorefice LE1,2, Galea MP3, Clark RA4, Doyle LW1,2,3, Spittle AJ2,3
1The University of Melbourne
2Muirhead Children’s Research Institute, Melbourne
3The Royal Women’s Hospital, Melbourne
4Australia School of Exercise Science, Australian Catholic University, Melbourne

Question: Do children born very preterm (<30 weeks) have poorer postural control compared with their term born peers at preschool age?

Design: Prospective cohort study.

Participants: One hundred and five very preterm children (<30 weeks’ gestational age) and a control group of 40 term born children were assessed at preschool age (4–5 years).

Intervention: A portable force plate, the Will™ Balance Board, was used to measure postural stability in seven balance items under various task parameters. The balance items included standing eyes open, standing eyes closed, standing eyes open foam mat, standing eyes closed foam mat, cognitive task and left and right single leg stand.

Outcome Measures: Poorer postural control was defined as increased postural sway which was measured by centre of pressure path length velocity on each balance item.

Results: Very preterm children demonstrated significantly increased postural sway in eyes open, mean difference = 0.6cm/s (95% CI 0.3 to 0.9) (p <0.0001) and eyes closed, mean difference = 0.6cm/s (95% CI 0.2 to 1.0) (p = 0.004) eyes open foam mat, mean difference = 0.8cm/s (95% CI 0.3 to 1.4) (p = 0.002) and cognitive task, mean difference = 0.8cm/s (95% CI 0.3 to 1.3) (p = 0.004), compared with children born at term.

Very preterm children demonstrated increased postural sway in eyes closed foam mat and single leg standing compared with term children however differences did not reach significance.

Conclusion: Very preterm children demonstrated poorer postural control compared with term children under different task parameters.

Key Practice Points:
- Assessment of postural control in very preterm children is important at preschool age to assist with transitioning to school.
- Postural control should be targeted as an area of intervention.
- The Will™ Balance Board is a useful tool as part of a battery of tests to assess postural control in children.

SCREENING EDUCATION AND RECOGNITION IN COMMUNITY PHARMACIES OF ATRIAL FIBRILLATION TO PREVENT STROKE (SEARCH-AF STROKE PREVENTION STUDY)

Lowres N1, Neubeck L2, Redfern J1, McLachlan A1, Krass P1, Bennett A1, Briffa T1, Salkeld G1, Brieger DB1, Sy RW1, Bauman A1, Freedman SB1
1Sydney Medical School, University of Sydney and Cardiology Department, Concord Hospital, Sydney
2The George Institute for Global Health, Sydney
3Faculty of Pharmacy, University of Sydney, Sydney
4School of Public Health, University of Western Australia, Perth
5School of Public Health, University of Sydney, Sydney

Question: Can allied health professionals screen for previously unknown atrial fibrillation (AF) to assist stroke prevention?

Design: Cross-sectional screening study in ten pharmacies.

Participants: General public aged ≥65 years.

Intervention: Screening by pharmacist using pulse palpation and iECG (handheld single-lead iPhone ECG, transmitted to secure iCloud). GP review/12-lead ECG was facilitated for those with suspected new AF.

Outcome Measures: AF diagnosis confirmed by cardiologist over-reading of iECG on iCloud. Stroke risk assessed using CHA2DS2-VASc stroke risk score.

Results: 1004 participants (mean age 76±7; 44% male). New AF was identified in 10 (1.0%, mean age 79±7), each with CHA2DS2-VASc scores ≥2 (mean 4.1±1.0), indicating high stroke risk. Only 2/10 reported symptoms of palpitations, and resting heart rate was not significantly elevated (77±14) versus counterparts without AF (74±12). Previous AF history was identified in 111 (11%), 57 of whom were in AF during screening. Overall 57% of those eligible for stroke prophylaxis were prescribed oral-anti-coagulants (OAC). 33/57 were unaware of AF diagnosis despite 21 taking OAC. Pharmacists identified 51/67 AF cases via either pulse or iECG interpretation. Overall sensitivity, specificity and kappa agreement for pharmacist interpretation of pulse were 81%, 93%, and 0.52; and ECG were 83%, 89% and 0.56.

Conclusion: Screening identified a sizeable cohort with previously unknown AF, unlikely to be identified on the basis of symptoms, at sufficient risk to require OAC for stroke prevention. Overall high stroke risk, relatively low OAC prescription, and poor knowledge of diagnosed AF sufferers also highlight the need for screening and subsequent education.

Key Practice Points:
- Physiotherapists commonly treat and exercise patients aged ≥65 years, who may have asymptomatic undiagnosed AF.
- Physiotherapists can screen for AF using pulse palpation or, if available, handheld ECG.
- Early identification of previously unknown AF and education for those patients with AF can assist stroke prevention.

CAN PHYSIOTHERAPIST-INITIATED LUNG ULTRASOUND CHANGE INTENSIVE CARE MANAGEMENT OF A DETERIORATING PATIENT AND PREVENT INTUBATION?

Lukasik M1, Kot M1, Bissett BS2,3, Green M1
1Physiotherapy Department, Canberra Hospital
2Intensive Care Unit, Canberra Hospital
3School of Physiotherapy, University of Canberra

Questions: Can physiotherapist-initiated lung ultrasound change intensive care management of a deteriorating patient and prevent intubation?

Design: Single case study.

Participant: 56 year old male patient admitted to ICU with acute respiratory deterioration with high risk of intubation: moist cough, widespread crackles on auscultation and worsening chest x-ray (white out of left hemi-thorax reduced intercostal spaces and tracheal deviation to the left – presumed left lung collapse).

Outcome Measures: Requirement for intubation, work of breathing, oxygenation and ventilation of the left lung (via auscultation and improvement in chest x-ray).

Results: Following 30 minutes of physiotherapy (positioning, deep breathing exercises, chest percussion and vibration, yankeur suction) sputum load was reduced and oxygenation improved but ventilation to the left lung remained unchanged. Lung ultrasound was performed by the physiotherapist (under guidance of the ICU specialist) and a large left-sided pleural effusion was detected. Physiotherapy staff discussed the lung ultrasound findings with the intensive care consultant leading to the insertion of a chest drain. Within 2 hours, > 1500mL of pleural effusion had drained, the patient’s work of breathing markedly reduced and intubation was avoided. Both chest x-ray and lung ultrasound showed dramatic re-recruitment of the left lung.

Conclusion: Lung ultrasound is a novel adjunct to physiotherapy assessment in ICU which may increase diagnostic accuracy and optimise physiotherapy management, avoiding invasive ventilation. Further research is required to establish the reliability of physiotherapist-driven lung ultrasound in the critical care setting where clinical assessment and radiology have limited sensitivity and specificity.

Key Practice Points:
- Lung ultrasound can be a useful assessment tool for the cardiorespiratory physiotherapist but is not yet standard practice in Australia.
- Lung ultrasound can be performed accurately by a physiotherapist, with direct influence on patient management in ICU.
- Timely differential diagnosis of lung pathology may avoid futile physiotherapeutic intervention.
IMPACT OF AGEING AND WORK ABILITY IN AN UNDERGROUND COAL MINE ENVIRONMENT: IMPLICATIONS FOR PROMOTING HEALTHY WORKING LIFE

Mackey M1, Noone J1, Bohle P1, Landry K2
1 The University of Sydney, Ageing Work and Health Research Unit
2 Occupational Therapist, Xstrata Coal – Bulga Underground Operations

Purpose: The aim of this presentation is to highlight the emergent occupational health issue of an ageing workforce and its implications for promoting health and wellbeing and work ability in an underground coal mine environment.

Description: The ageing of the Australian workforce raises important questions concerning the maintenance of a good person-organisation fit over a working-life. Older workers have a higher rate and cost of some work injuries and disease than younger workers. Work injuries are particularly prolific in the mining sector, with an increase in the number of injury claims by 11% between 2000 and 2009. It is also known that physical capacity (fitness, muscle strength and flexibility) declines with increasing age, which is of major concern especially for workers involved in physically demanding work such as underground coal mining operations. Lower physical capacity with ageing may be partly due to lower levels of participation in physical activity and increased sedentariness in home, transport and leisure. Importantly, physical inactivity and sitting time are known to be independently associated with higher risk of chronic disease-related morbidity and mortality and, as with ageing, are associated with declining work ability. This conference paper will detail the design and outcomes of a study undertaken in an underground coal mine in the Hunter Valley NSW in 2012. This study’s objective was to measure the work ability of underground coal mine workers and to determine the effect of a 16-week health and wellbeing strategy on the work ability of study participants.

Implications: This presentation will provide evidence-based recommendations for occupational health professionals regarding promotion of work ability and wellness for mine workers in the context of an ageing working population.

Key Practice Points:
• The workforce is ageing and its effects need to be managed
• Physical inactivity is increasingly prevalent in working life
• Measuring work ability can assist in targeting interventions to minimise injury risk and promote wellness

THE DISTRIBUTION OF MUSCLE WEAKNESS IN PATIENTS RECENTLY DISCHARGED FROM INTENSIVE CARE

Mackney J1, Jenkins S2, Fehlberg R3, Thomas L4, Havill K4, Hill K2
1 The University of Newcastle, NSW
2 Curtin University, Perth
3 Sir Charles Gairdner Hospital, Perth
4 John Hunter Hospital, NSW

Questions: To what extent is muscle force reduced in patients recently discharged from intensive care? Are all muscles affected to a similar extent?

Design: Prospective, observational study.


Outcome Measures: Anthropometric data and details of care in the intensive care unit were recorded. Grip force, measured with a Jamar® Adjustable Hand Dynamometer, elbow and shoulder flexor force measured with a hand held dynamometer, and knee extension force measured with a custom designed fixed force gauge, was assessed within seven days of discharge from intensive care.

Results: The critical illness and acute respiratory distress syndrome survivor groups were similar in terms of age, sex, severity of illness and total hours ventilated (all p>0.05). There were no observed adverse events during the six-minute walk tests. The six-minute walk distance was similar in the critical illness survivor (199 m [251 m]), and acute respiratory distress syndrome survivor groups (142 m [153 m]; p=0.44). Quadriceps femoris strength was similar between the groups (138 N [89] vs. 135 N [88]; p=0.46). Both the two participant groups considered together, six-minute walk distance and quadriceps femoris force were assessed within seven days of discharge from intensive care.

Conclusion: Although there was a marked decrement in both upper and lower limb muscle force following an intensive care admission, quadriceps force was the most severely affected.

Key Practice Points:
• Muscle force was decreased in both the upper limbs and lower limbs in patients recently discharged from ICU with quadriceps femoris force more severely affected.
• Exercise and physical activity should be considered for all patients admitted to ICU in order to minimise the marked decrements in muscle force experienced during their recovery.

THE SIX-MINUTE-WALK DISTANCE: A USEFUL METRIC FOR INPATIENT REHABILITATION

Mackney J1, Jenkins S2,3, Fehlberg R4, Thomas L4, Havill K4, Hill K2
1 The University of Newcastle, NSW
2 Curtin University, Perth
3 Sir Charles Gairdner Hospital, Perth
4 John Hunter Hospital, NSW

Question: Is the six-minute walk test safe and feasible in patients recently discharged from the intensive care unit? Does six-minute walk distance correlate with quadriceps force in this population?

Design: Prospective, observational study.


Outcomes measures: Anthropometric data and details of care in the intensive care unit were documented. Both six-minute walk distance and quadriceps femoris force were assessed within seven days of discharge from intensive care.

Results: The critical illness and acute respiratory distress syndrome survivor groups were similar in terms of age, sex, severity of illness and total hours ventilated (all p>0.05). There were no observed adverse events during the six-minute walk tests. The six-minute walk distance was similar in the critical illness survivor (199 m [251 m]) and acute respiratory distress syndrome survivor groups (142 m [153 m]; p=0.44). Quadriceps femoris strength was similar between the groups (138 N [89] vs. 135 N [88]; p=0.46). Both the two participant groups considered together, six-minute walk distance and quadriceps femoris force were assessed within seven days of discharge from intensive care.

Conclusion: The six-minute walk test was both safe and feasible in patients admitted to a ward following discharge from intensive care. The association between quadriceps strength and six-minute walk distance suggests muscle weakness contributes importantly to exercise limitation in the post intensive care setting.

Key Practice Points:
• The six-minute walk test was safe and feasible in the post intensive care setting and may assist with exercise prescription.
• Quadriceps femoris weakness appears to contribute to the reduced exercise capacity in patients recently discharged from intensive care.

DISCHARGED FROM INTENSIVE CARE

THE IMPACT OF AGEING ON MUSCLE FORCE AND FUNCTION IN PATIENTS recently discharged from intensive care

The impact of ageing on muscle force and function in patients recently discharged from intensive care can be significant. A recent study by Mackney et al. investigated the distribution of muscle weakness in patients recently discharged from intensive care. They found that muscle force was decreased in both the upper limbs and lower limbs in patients recently discharged from intensive care with quadriceps femoris force more severely affected. Exercise and physical activity should be considered for all patients admitted to ICU in order to minimise the marked decrements in muscle force experienced during their recovery. Further research is needed to understand these decrements better and to develop effective interventions to promote healthy working life.
Practice points:
- Walking endurance at one and three months is associated with activity levels after stroke.
- This study further highlights the importance of cardiovascular training during rehabilitation of stroke survivors.
- Further investigation of the effect of factors other than walking capacity on activity levels after stroke is required.

DO ACTIVITY LEVELS OF STROKE SURVIVORS CHANGE BETWEEN ONE AND THREE MONTHS FOLLOWING DISCHARGE FROM HOSPITAL?

Mahendran N1, Kuys SS2,3, Brauer SG1
1Division of Physiotherapy, School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane
2Griffith Health Institute, Griffith University, Gold Coast
3Allied Health Research Collaborative, The Prince Charles Hospital, Brisbane

Questions: Do activity levels of stroke survivors change between one and three months following discharge from hospital? Are activity levels different between slower and faster walkers?

Design: Repeated-measures observational study
Participants: Twenty sub-acute stroke survivors (aged 71±13 years, 70% male, 60% faster walkers) were recruited.

Intervention: Nil.

Outcome Measures: Gait speed was used to divide the sample into slower (<0.8m/s) and faster (>0.8m/s) walkers. Participants wore an ActiPalm™ accelerometer over four days at one and three months post-discharge. Average time spent lying/sitting, standing and walking and average step count over each four-day period were calculated. Paired sample t-tests were used to determine differences over time.

Results: At one month, participants spent an average of 20.0±1.8 hours sitting/lying, 2.9±1.1 hour standing and 1.0±0.6 hours walking per day. They averaged 475±3641 steps per day at one month. There were no significant changes between one and three month activity levels for the whole sample except for time spent standing, which increased by 40% (to 4.0 hours). When separated by walking speed, slower walkers increased their time spent standing by 71% (2.0 hours), walking by 33% (0.3 hour) and step count per day by 40% (2583 to 3617 steps) at three months. Faster walkers also increased their time spent standing by 19% (0.6 hour) but took 19% fewer steps (6202 to 5054 steps) at three months.

Conclusion: After stroke, slower walkers increased their upright activity levels from one to three months, however faster walkers show reduced activity at three months following hospital discharge.

Practice points:
- Stroke survivors spend the majority of their time inactive at one and three months after stroke.
- Follow up of activity levels after discharge, regardless of walking speed, is suggested as some deterioration in activity has been identified at three months.

CARE TRACK AUSTRALIA – HOW APPROPRIATE IS LOW BACK PAIN CARE IN AUSTRALIA?

Ramanathan S1, Hibbert P2,3, Maher CG4, Day R4, Hindmarsh DM5, Hunt TD1, Hannaford NA6, Runciman B7
1Senior Research Fellow, Hunter Valley Research Foundation, Newcastle, NSW and PhD Candidate, University of South Australia
2Program Manager – Australian Institute of Health Innovation, University of New South Wales
3Director, The George Institute for Global Health and Professor, Sydney Medical School, The University of Sydney
4Professor of Clinical Pharmacology, St Vincent’s Clinical School and School of Medical Sciences, University of New South Wales
5Biostatistician, Australian Institute of Health Innovation, University of New South Wales
6Project Manager, Clinical Research, University of South Australia
7Senior Analyst, Clinical Research, Australian Patient Safety Foundation, and University of South Australia

LEVELS AFTER STROKE

MacMahon M

Update: APA Aquatic Physiotherapy Guidelines for Physiotherapists Working in and/or Managing Hydrotherapy Pools 2013.

Background: The APA recognised that the focus of the APA Guidelines for Physiotherapists Working in and/or Managing Hydrotherapy Pools (2002) needed to shift and be updated. The new guidelines were formulated to help maximise safety and professional standards, by utilizing the most recent research and clinical expertise.

Design: Searches were performed using databases Medline and Cinahl, for 2000-2011, in the areas of pool infection control, safety and physiological effects of immersion. Appraisal of guidelines research and evaluation (AGREE) instrument was used for guideline development. Where there was insufficient evidence a Delphi Survey was undertaken.

Participants: The project officer undertook the literature reviews and updated the guidelines which were then reviewed by a working party of three experienced aquatic clinicians. The Delphi Consensus was made up of 14 aquatic physiotherapy clinicians.

Results: Pool infection control now includes comprehensive advice on specific organisms and conditions and how to manage them. There is expanded research information on the physiology of immersion and its effect on cardiac, renal and respiratory conditions as well as autonomic dysreflexia, asthma and pregnancy. The Delphi Survey did not reach consensus on all safety issues. These will be documented in the guidelines.

Conclusion: These updated guidelines will provide a valuable resource in improving infection control management, occupational health and safety and management of specific conditions to all clinicians working in Aquatic Physiotherapy.

Key Practice Points:
- The guidelines provide comprehensive information on hydrotherapy pool infection control and management.
- The guidelines address the unique safety management aspects of treating patients in water.
- Screening of patients is assisted by the expanded information on the physiological effects of immersion on specific conditions.

WALKING CAPACITY AND ACTIVITY LEVELS AFTER STROKE

Mahendran N1, Kuys SS2,3, Brauer SG1
1Division of Physiotherapy, School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane
2Griffith Health Institute, Griffith University, Gold Coast
3Allied Health Research Collaborative, The Prince Charles Hospital, Brisbane

Questions: Are activity levels after stroke at one and three months post hospital discharge related to walking capacity?

Design: Repeated-measures observational study
Participants: Twenty sub-acute stroke survivors (aged 71±13 years, 70% male, 60% faster walkers) were recruited.

Intervention: Nil.

Outcome Measures: Measures were collected at discharge, one and three months post-discharge. Timed 10m walk (speed) and 6-minute walk (endurance) provided measures of walking capacity on activity levels after stroke.

Results: Walking endurance at one and three months was associated with number of steps/day (r = 0.476 (p = 0.046)). There was a trend between endurance, time spent walking and step count at one month (r = 0.464 to 0.468, p = 0.061). Discharge measures were not related to activity levels at one and three months. Walking capacity was not related to time spent sitting/lying.

Conclusion: Walking endurance (6-minute walk test) is associated with activity level at one and three months post discharge following stroke.
Questions: What proportion of healthcare encounters for low back pain align with recommended care?
Design: Retrospective observational study.
Participants: CareTrack Australia enrolled a representative sample of Australians who had seen a health care provider or been hospitalised in 2009-2010 and where both clinician and patient agreed for the clinical records to be reviewed. The low back pain sub-study is based upon 6,588 health care encounters provided to 164 patients by up to 177 health care providers (GP, allied health clinician, medical specialist or hospital health care provider) based at 86 practices and 11 hospitals.

Outcome Measures: Clinical indicators for the management of low back pain were derived from existing guidelines and then refined by a panel of rheumatology, physiotherapy and general medicine experts. Experienced registered nurses reviewed participants’ clinical records to measure compliance (yes/no) with each clinical indicator.

Results: Compliance with the 10 indicators ranged from 42% (Patients presenting with low back pain had been asked about/assessed for infection (fever, IV drug use)) to 98% (Patients with acute low back pain were NOT advised to rest in bed.) Overall, the average compliance with all indicators was higher for hospital and allied health providers (93% and 92%) than for GPs (54%) or medical specialists (39%).

Conclusion: Compliance with recommended care is good for several important aspects of care, but there are more mixed results in screening for serious diseases such as fracture and infection, and compliance with indicators varied between the professions studied.

Key Practice Points:
- Compliance was excellent for avoiding prescribing ineffective treatment such as bed rest.
- Unfortunately many patients with low back pain are not screened for serious diseases.
- Efforts to improve practice may need to be profession-specific as the areas for improvement differed quite substantially between professions.

EFFECTIVE IMPLEMENTATION OF AN EXERCISE PROGRAM POST BREAST CANCER SURGERY

Cepnj D, Maka K.
Physiotherapy Department, Westmead Hospital, Sydney

Questions: Does a 12 week exercise program lead to improved range of motion and strength gains? Is there improvement in reported pain and disability? What is the impact on quality of life? Is there any change in bioimpedence measures and its impact on lymphoedema?
Design: Observational study.
Participants: Forty patients who had undergone breast cancer surgery and were receiving physiotherapy intervention.
Intervention: A supervised 12 week exercise group program for patients who have undergone breast cancer surgery.
Outcome Measures: Range of motion, strength, shoulder pain and disability index (SPADI), quality of life, six minute walk test and bioimpedence were measured at commencement of the group and upon completion of the group.

Results: The average age of patients referred to the group was 56 years (range of 29 to 71 years). The average time since surgery was 6.9 months (range of 2 to 16 months). The average initial shoulder flexion ROM was 154.5° (range of 96 to 176°) and the average initial shoulder abduction ROM was 134.5° (range of 93 to 170°). The mean within patient change for flexion range was 9.5 (95% CI 6.2 to 12.8, p = 0.003). The mean within patient change for abduction range was 8.5 (95% CI -4.3 to 12.7, p = 0.002). The mean within patient change for the SPADI was -12.3 (95% CI -4.4 to -20.1, p = 0.016). Bioimpedence measures remained stable.

Conclusion: A group exercise program, in line with current literature, can be effectively implemented in the clinic with encouraging results.

Key Practice Points:
- Range of motion and strength at the shoulder improves with a 12 week group exercise program
- Pain and disability is reduced after a 12 week group exercise program
- There is no exacerbation or production of lymphoedema symptoms during a 12 week group exercise program

ACHILLES AND PATELLAR TENDINOPATHY EXERCISE PROGRAMMES: A SYSTEMATIC REVIEW COMPARING CLINICAL OUTCOMES AND IDENTIFYING POTENTIAL MECHANISMS FOR EFFECTIVENESS

Malliaras P1, Barton CJ2, Reeves ND1, Langberg H1
1Centre for Sports and Exercise Medicine, Middle East Hospital, Queen Mary, University of London, London, UK
2Institute for Biomedical Research into Human Movement and Health, Manchester Metropolitan University, Manchester, UK

Question: Is isolated eccentric exercise associated with superior clinical outcomes than other exercise in Achilles and patellar tendinopathy rehabilitation, and what are the potential mechanisms associated with different types of exercise?
Design: A systematic review of studies comparing exercise programs or potential mechanisms for effectiveness in Achilles and patellar tendinopathy with narrative synthesis.
Participants: Patients receiving exercise as a treatment for Achilles or patellar tendinopathy who were followed up after four weeks or longer.
Intervention: Exercise could include isolated eccentric, isolated concentric, combined eccentric-concentric, isometric and stretch-shortening cycle (SSC). Stretching alone was not included. Studies that compared loading with and without continued sport were included.
Outcome Measures: Clinical outcomes including pain and function were investigated for studies comparing exercise programs. Non-clinical outcomes (e.g. imaging) were investigated for studies investigating potential mechanisms for effectiveness.
Results: The search yielded 33 studies with a mean quality score of 54%. There is limited (Achilles) and conflicting (patellar) evidence that clinical outcomes are superior with eccentric exercise compared with other exercise. Neuromuscular performance (e.g. torque) is consistently associated with improved clinical outcomes, and there was equivalent (Achilles) or higher (patellar) level evidence that concentric-eccentric exercise could achieve this. Most studies did not find imaging outcomes improved alongside clinical outcomes.

Conclusion: There is little evidence for isolating the eccentric component in Achilles and patellar tendinopathy rehabilitation, although there are few good quality studies that compare exercise regimes and investigate potential mechanisms. Exercise should be based on evidence and clinical reasoning and consider individual patient factors.

Key Practice Points:
- Isolated eccentric exercise is not clearly superior to other exercise in Achilles and patellar tendinopathy rehabilitation
- Other exercise, such as concentric-eccentric is effective and may be preferable for some presentations
- High quality studies comparing exercise and investigated potential mechanisms are needed

AN EFFECTIVE AND EFFICIENT BLENDED LEARNING APPROACH FOR SUPPORTING PRACTICAL SKILL DEVELOPMENT OF THE ADULT LEARNER

Maloney S, Seville C, Cope L, Dalwood N, Morgan P

Question: What are physiotherapy students’ perceptions of a blended learning model for practical skill acquisition?
Design: Post-intervention survey
Participants: 72 Year 3 pre-clinical physiotherapy students.
Intervention: 2 x 2 hour practical sessions (lumbar and vestibular assessment/treatment) were designed using an innovative blended learning method. Key design elements included 1) all instructional material online, supported by multimedia demonstrations, 2) the first hour dedicated to self-directed engagement with learning materials and peer practice. The tutor was present for the second hour to provide feedback and skill refinement.

Outcome Measures: Students’ experiences (Likert responses) and free text options. Direct teaching costs were calculated.
Results: Fifty-two students (72%) and twenty-three students (32%) completed surveys following lumbar and vestibular practicals respectively. Pooled responses revealed 93% of students accessed learning materials before the scheduled practical time, allowing students to look up and prepare prior to the practical. Eighty-eight percent of students felt more in control of their learning. Ninety-four percent of students agreed strongly agreed that they were happy with the practical format. One participant reported that increased tutor time affected educator relationship. Potential sessional staff savings were calculated at 4 hours per session.

Conclusions: Innovative application of blended learning can lead to efficiencies, valued by students and staff. Implementation can be achieved without jeopardising student-staff relationship, and empower students to take control of their learning.

Practice Points:

• Careful implementation of blended learning can facilitate adult learning skills and student centered learning.
• Efficient use of time, feedback opportunities and access to learning materials is valued by students.
• Reducing face-to-face tutor time can result in a net increase in feedback on performance.

PULMONARY REHABILITATION VERSUS SELF-MANAGEMENT FOR PEOPLE WITH MODERATE TO SEVERE CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A RANDOMISED CONTROLLED TRIAL

Mandrusiak A1, Haines T1, Nitz J1, Chang A1, Yang I1, Low-Choy N1, Jackson C1, Vicenzino B1

1Division of Physiotherapy, School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane
2Allied Health Research Unit, Monash Health; Physiotherapy Department, Southern Health Pulmonary Clinical School, Monash University, Melbourne
3School of Medicine, The University of Queensland; The Prince Charles Hospital, Brisbane
4School of Physiotherapy, Health Sciences, Australian Catholic University (McCauley Campus), Brisbane; Physiotherapy Department, The Prince Charles Hospital, Brisbane
5Centres for Primary Care Reform Research Excellence: Discipline of General Practice, School of Medicine, The University of Queensland; Royal Brisbane and Women's Hospital, Brisbane

Question: What are the relative clinical benefits of pulmonary rehabilitation versus self-management for people with chronic obstructive pulmonary disease?

Design: Randomised controlled trial with assessor blinding and intention-to-treat analysis.

Participants: 169 individuals with moderate to severe chronic obstructive pulmonary disease.

Intervention: The pulmonary rehabilitation group completed an eight week standardised program (two x 2 hour sessions each week) including education, and strengthening and cardiovascular exercises. The self-management group completed a six week Stanford chronic disease self-management program (one x 2-3 hour session each week) including education.

Outcome Measures: The primary outcome was the St George Respiratory Questionnaire. Secondary outcomes included a series of questionnaires (Frenhay Activity Index, International Physical Activity Questionnaire, Hospital Anxiety Depression Scale, COPD Self-Efficacy Scale). Measures were taken at baseline, three, six, nine and 12 months. Respiratory function and incremental shuttle walk were measured at baseline and three months.

Results: Participants in the pulmonary rehabilitation group (n = 85) reported significantly better Symptoms score (frequency and severity of respiratory symptoms including cough, wheeze and dyspnoea) on the St George Respiratory Questionnaire across follow-up compared to the chronic disease self-management group (n = 84) (GEE coefficient 5.48 (95% CI 0.64 to 10.33), p = 0.03), with beneficial but non-significant trends noted also for the Activity and Total scores on this questionnaire. There were no significant differences between groups on the secondary outcomes.

Conclusion: Participation in pulmonary rehabilitation contributed to a greater improvement in perception of respiratory symptoms compared to participation in a self-management program in this population.

Trial registration: NCT00082269.

HEMIPLEGIC SHOULDER PAIN IN ACUTE STROKE

Marr LC, Werner LJ, Gorelik A
Royal Melbourne Hospital, Melbourne

Questions: What is the incidence of hemiplegic shoulder pain in acute stroke patients? Is a risk assessment tool effective for the development of pain? What factors are associated with development of hemiplegic shoulder pain?

Design: Prospective observational study.

Participants: One hundred consecutive stroke patients were included from the Royal Melbourne Hospital Stroke Unit.

Outcomes: Risk of hemiplegic shoulder pain was assessed with the Management Tool for Acute Hemiplegic Shoulder (MTAHS). Other outcomes included the Mobility Scale for Acute Stroke (MSAS) and the Modified Rankin Scale.

Results: 6% of patients developed hemiplegic shoulder pain during their admission. Patients scoring high risk assessed by the MTAHS on admission had a significant chance of developing pain (p = 0.003). There was also a significant association between patients being scored high risk on the MTAHS and the occurrence of severe physical impairment assessed by the MSAS (p = 0.0000). Length of hospital stay was significantly associated with incidence of pain on discharge (p = 0.0004). The median length of stay for those without pain was seven days (IQR 5–11); compared with those with pain, whose median length of stay was 17 days (IQR 14–22).

Conclusion: The use of the MTAHS risk assessment tool could assist in identifying which patients need to be targeted by physiotherapists and occupational therapists for ongoing management strategies to prevent development of hemiplegic shoulder pain to minimise the consequences of this as time progresses.

Key Practice Points:

• The use of a risk assessment tool allows timely identification of hemiplegic shoulders at risk of developing pain.
• Greater risk of hemiplegic shoulder pain, assessed by the Management Tool for Acute Hemiplegic Shoulder (MTAHS) risk assessment tool, is associated with worse physical impairment and longer length of hospital stay.
• Early identification of potential risk factors could assist in appropriate management to decrease rates of hemiplegic shoulder pain.

IS CULTURE CHANGE IN INTENSIVE CARE POSSIBLE? THE EXPERIENCE OF ONE PHYSIOTHERAPY DEPARTMENT IN IMPLEMENTING EVIDENCE BASED PRACTICE

Marzano V
Canberra Hospital, Canberra

Introduction: Physiotherapy is perceived as an integral part of the management of patients in intensive care with an ever increasing body of evidence. However, one barrier to implementing evidence based practice is local culture. We present the experience of one large metropolitan teaching hospital where physiotherapists had a limited ability to implement evidence based interventions in this environment. This led to staff dissatisfaction, conflict in the multidisciplinary team and delayed physiotherapy intervention.

Methodology: Resistance to culture change was overcome over a three year period using a multiple strategy approach including regular senior physiotherapy presence 7 days a week; a consistent approach to advocating for evidence based interventions; physiotherapy involvement in development and co-authoring of unit policy and procedure documents; multidisciplinary quality improvement projects; physiotherapy service developments designed to promote intensive care admissions; commencement of research projects; large scale education programs; and the provision of after hours service to a high acuity patient.
Results: This approach has led to improvements in work environment include staff satisfaction, and improved team dynamics. In terms of service delivery, physiotherapists in this ICU are now able to prescribe and utilise non-invasive ventilation, commence early rehabilitation and mobilisation with intubated patients and continuous renal replacement therapy. Furthermore, this culture change has facilitated the publication and endorsement of physiotherapy policy and procedure documents, and an after-hours service funded by intensive care.

Conclusion: Culture change in order to the deliver evidence based physiotherapy is feasible and requires multiple strategies and perseverance to achieve this outcome.

Key Practice Points:
• Implementation and utilisation of innovative physiotherapy techniques requires a culture that is receptive to change
• Culture change in the Intensive Care environment is achievable over time by engaging and collaborating with all members of the multidisciplinary team with perseverance

A COMPARISON OF LAND EXERCISE AND AQUATIC PHYSIOTHERAPY IN THE TREATMENT OF CHRONIC LOW BACK PAIN

Massarany JE
Physiotherapy Department Austin Health, Melbourne

Question: In patients with chronic low back pain, what is the effect of an aquatic physiotherapy exercise program compared to a land based exercise program on pain and function?


Participants: Adults with chronic low back pain.

Intervention: An exercise program in water was compared to an exercise program on land or to a land exercise program with an additional pool component.

Outcome Measures: Quality was evaluated for the trial papers using the McMaster scale and the rating checked against the PEDro scale. The AMSTAR checklist was used to evaluate quality of the review papers. Studies utilised a heterogeneous range of outcome measures of pain, function and quality of life.

Results: The search yielded six studies of high quality and six review papers of moderate quality. Both aquatic and land programs were found to be valid, safe and effective with only one trial finding an advantage of aquatic exercise over land exercise for function and quality of life. In both groups the more vigorous programs showed the greatest effect on pain and function (p < 0.001).

Conclusion: From the limited number of high quality studies conducted to compare aquatic physiotherapy and land based exercise for chronic low back pain, it can be concluded that there is a paucity of evidence to support one method over the other. However, this review supports the existing body of evidence that exercise is an efficacious modality for the management of chronic low back pain.

Key Practice Points:
• Strong evidence supports both land and aquatic exercise programs to reduce pain and improve function in patients with chronic low back pain.
• Neither program was found to be superior.
• Further research is required to determine which exercises are superior and the optimal length or number of sessions.

DEVELOPMENT AND IMPLEMENTATION OF A CLINICAL PRACTICE GUIDELINE FOR PHYSIOTHERAPY MANAGEMENT IN ABDOMINAL SURGERY

May K, Holdsworth C, Skinner EHI
1 Western Health, Melbourne
2 Monash University, Melbourne
3 The University of Melbourne, Melbourne

Question: Does the development and implementation of a physiotherapy clinical practice guideline for patients who have had abdominal surgery have an effect on clinical outcomes?

Design: Phase 1 involved development and implementation of a clinical practice guideline. Phase 2 will evaluate the implementation of the guideline.

Participants: Adult patients following abdominal surgery.

Intervention: Guideline purpose was identified and guided by key stakeholders. A systematic review was conducted and results were synthesised to formulate graded recommendations for physiotherapy interventions. Guidelines were reviewed by key stakeholders for further input. Phase two of this study involves guideline evaluation.

Outcome Measures: Formulation of a clinical practice guideline approved by key stakeholders for dissemination and implementation followed by evaluation of guideline implementation on clinical outcomes.

Results: A clinical practice guideline was developed with graded recommendations based on the results of a systematic literature review and involvement of key stakeholders. Literature review identified early mobilisation as a first-line physiotherapy treatment after abdominal surgery. Key stakeholders identified further subsections for inclusion. The guideline was implemented. Phase two is due for completion in December 2013.

Conclusion: A clinical practice guideline was developed to provide physiotherapists with a best practice model of care for the management of patients following abdominal surgery. Phase two will evaluate the efficacy of these guidelines on physiotherapy management and patient length of stay. Investigation of physiotherapists understanding and awareness of the content of the guidelines would also be of benefit.

Key Practice Points:
• Clinical practice guidelines provide a summary of the current evidence for the management of specific patient populations.
• Evidence for physiotherapy management of patients following abdominal surgery can be formulated into a clinical practice guideline.
• Future study will evaluate the effect of implementation and translation to clinical practice.

PATIENT PERCEIVED READINESS FOR DISCHARGE FROM HOSPITAL BASED REHABILITATION TO HOME

Martin S1,2, Kuys S1, Donovan J3, Stanton W1, Low Choy N1,4
1 Australian Catholic University, Brisbane
2 Griffith University, Gold Coast
3 Princess Alexandra Hospital, Woolloongabba
4 The Prince Charles Hospital, Chermside

Question: Do self-reported scores about readiness for hospital discharge differ from those reported 1-month after being home?

Design: Prospective observational study.

Participants: Sixty-eight female and 47 male adults (FIM Cognitive >25) with neurological, ortho-geriatric and general debility diagnoses completed inpatient rehabilitation at a tertiary Brisbane hospital.

Outcome Measures: Demographic details and rehabilitation length of stay were recorded. The self-reported Modified Readiness for Hospital Discharge Scale (MRHDS) was administered at discharge and after 1-month at home. ANOVA determined differences between participant groups while paired t-tests identified any differences between sub-scales of knowledge, personal status, coping ability, expected support and total MRHDS scores at discharge and 1-month.

Results: The neurological group (62.78 SD15.1 years) was significantly younger than the ortho-geriatric (76.5 SD14.4 years) and general-debility (74.2 SD15.5 years) groups but required longer rehabilitation stays (67.8 SD55.8 days) than the ortho-geriatric (42.0 SD32.7 days) and general-debility (45.7 SD44.8 days) groups. No between group differences were observed for MRHDS scores. Significantly lower scores at 1-month were observed for MRHDS sub-scales of personal status, expected support, and total score (t>2.56; p < 0.05).

Conclusion: Patients at discharge from inpatient rehabilitation appear to overestimate their perceived readiness for discharge compared to 1-month follow-up. This has implications for discharge planning by physiotherapists who need to consider training physical capacity in the context of the home, available strategies and resources, including social support, to assist with transition to home.

Key Practice Points:
• The MRHDS may be useful to determine patient perceived readiness for discharge.
• Patients tend to overestimate physical abilities and available supports
• Physical function needs to be assessed and managed in the context of home environments may assist with transition to home.
THE EFFECT OF CHEST PHYSIOTHERAPY ON REGIONAL LUNG VOLUME CHANGES IN VENTILATED CHILDREN USING ELECTRICAL IMPEDANCE TOMOGRAPHY

**Conclusion:** PaCO2 (p = 0.01) overall than children who did not receive chest physiotherapy. The chest physiotherapy group demonstrated significantly higher end expiratory lung volumes (p < 0.001) compared to children who received suction alone. They also demonstrated a significantly higher global inhomogeneity index (p = 0.01) indicating a less uniform distribution of ventilation throughout the lung fields. The chest physiotherapy group had significantly lower SpO2/FiO2 (p = 0.004) and a higher PaCO2 (p = 0.01) overall than children who did not receive chest physiotherapy. No other significant differences were noted.

**Outcomes:** Chest physiotherapy included radiological changes on chest x-ray and/or clinical evidence of secretion retention.

**Key Practice Points:**
- Chest physiotherapy may have advantages over suction alone.
- Chest physiotherapy may have positive short to medium term effects on gas exchange and oxygenation.

**Patients with Knee Replacement Adapting Abnormal Movement Strategies to Negotiate Stairs**

**McClelland J**, **Kate E. Webster K**, **Menz HB**, **Feller JA**

**Key Practice Points:**
- Clinicians should assess patients for reports of poor sleep quality.
- Future research needs to determine whether targeting sleep improvement contributes to pain reductions.

**Patients with Knee Replacement Do Not Use All of Their Available Knee Motion to Complete High-Flexion Functional Activities**

**McClelland J**, **Webster K**, **Menz HB**, **Feller JA**

**Questions:** Is achieving high degrees of knee flexion important to participation in functional activities following total knee replacement? Do patients with knee replacement use normal movement strategies, and joint biomechanics to negotiate stairs?

**Key Practice Points:**
- Only half of patients with knee replacement successfully negotiated stairs without assistance.
- Patients adopted abnormal strategies to ascend and descend stairs.
- Rehabilitation that retrains normal quadriceps use during stair-climbing ability contributes to pain reductions.

**Poor Sleep Quality Is Strongly Associated with Subsequent Pain Intensity for Patients with Acute Low Back Pain**

**Alsaadi SM**, **McAuley JH**, **Hush JM**, **Lo S**, **Lin CW, Williams CM**, **Maher CG**

**Questions:** Are manual chest physiotherapy techniques better than suction alone in improving regional ventilation distribution in children receiving mechanical ventilation? 

**Design:** Retrospective clinical case-control study.

**Participants:** Sixty children aged 0-18 years receiving mechanical ventilation were included in this study.

**Intervention:** Seventeen received chest physiotherapy consisting of percussion, vibrations, manual hyperinflation and airway suction. The remaining forty three children received manual hyperinflation and airway suctioning only. Indications for chest physiotherapy included radiological changes on chest x-ray and/or clinical evidence of secretion retention.

**Outcome Measures:** EIT was used to record measurements of regional ventilation distribution (Global and regional end expiratory levels and amplitude, and global inhomogeneity) and temporal synchronicity. Recordings were taken prior to intervention immediately after intervention and at 30 and 120 minute intervals. Arterial blood gas samples were also sampled at the same time points.

**Results:** Overall children who received chest physiotherapy demonstrated significantly higher end expiratory lung volumes (p < 0.001) compared to children who received suction alone. They also demonstrated a significantly higher global inhomogeneity index (p = 0.01) indicating a less uniform distribution of ventilation throughout the lung fields. The chest physiotherapy group had significantly lower SpO2/FiO2 (p = 0.004) and a higher PaCO2 (p = 0.01) overall than children who did not receive chest physiotherapy. No other significant differences were noted.

**Conclusion:** Chest physiotherapy in mechanically ventilated children results in improved end expiratory lung volumes compared to suction alone however may result in changes to other measures of gas exchange and oxygenation.

**Key Practice Points:**
- Chest physiotherapy may have short to medium term effects on ventilation distribution in mechanically ventilated children with lung disease as measured with EIT.
- Chest physiotherapy may have advantages over suction alone in this population with respect to improving end expiratory lung volumes.
- EIT has the potential to quantify direct changes within the lung in mechanically ventilated children in response to chest physiotherapeutic interventions.

**Patients with Knee Replacement Do Not Use All of Their Available Knee Motion to Complete High-Flexion Functional Activities**

**Alsaadi SM**, **McAuley JH**, **Hush JM**, **Lo S**, **Lin CW, Williams CM**, **Maher CG**

**Questions:** Is achieving high degrees of knee flexion important to participation in functional activities following total knee replacement? Do patients use all of their available range of knee flexion during high-flexion functional activities? Do patients with greater available range of motion use more knee flexion during demanding functional activities than those with less available motion?
**NEEDLING IN TENDINOPATHIES**

**McCutcheon L**

Tendinopathy is associated with an absence of inflammatory markers and is characterised by an abnormal healing response. A greater amount of apoptosis, poor collagen organisation and type, increased glycosaminoglycans, neo-vascularisation and neural ingrowth have been noted in tendinopathic tendons. Release of platelet derived growth factor into tissue via dry needling and autologous blood injections is considered beneficial in accelerating a normal healing reaction in tendinopathic tendons. Acupuncture and Dry Needling is associated with a reactive chemical milieu which occurs around the needle mimicking the early stage of healing. The use of acupuncture and dry needling in tendinopathic tendons is considered along with techniques which may be beneficial to produce clinically relevant outcomes.

**THE COMPLEX NATURE OF CLINICAL INTERVIEW DATA: LEARNING FROM ACUTE LOW BACK PAIN ACCOUNTS**

**McCrurn CA**, **Moore AP**, **Hall V**

1 University of Brighton, Clinical Research Centre for Health Professions, Eastbourne, UK
2 East Sussex Healthcare NHS Trust, UK
3 University of Brighton, Centre for Health Research, Falmer, UK

**Question:** What is the nature of interview data as knowledge for use in practice? **Background:** Integral to physiotherapy is the generation, interpretation and use of information from clinical interviews. There is extensive literature on the nature of research interview data and of information generated through patient/practitioner interactions in other disciplines. However, there is little research on this key source of data underpinning clinical reasoning and decision-making within physiotherapy.

**Design:** This qualitative study explored accounts of 19 participants interviewed through acute low back pain experiences until recovery or 3 months with persisting problems. Data analysis drew on Sociolinguistics, Communication Science and Discursive Psychology.

**Results:** Analysis found that descriptions of mental/emotional states, thoughts, attitudes, beliefs, and personal conduct served primary communicative functions including improving knee flexion range under weightbearing conditions may facilitate enhanced plasticity in the motor cortex, but does a single intervention:

**Priming the Brain: A Single Bout of Aerobic Exercise Promotes Motor Cortical Neuroplasticity**

**McDonnell MN**, **Buckley JD**, **Opie GM**, **Ridding MC**, **Semmler JG**

1 School of Health Sciences, University of South Australia, Adelaide
2 Nutritional Physiology Research Centre, University of South Australia, Adelaide
3 Discipline of Physiology, School of Medical Sciences, The University of Adelaide, Adelaide
4 Neuromotor Plasticity and Development, The Robinson Institute, School of Paediatrics and Reproductive Health, The University of Adelaide, Adelaide

**Question:** What is the nature of interview data as knowledge for use in practice? **Background:** Integral to physiotherapy is the generation, interpretation and use of information from clinical interviews. There is extensive literature on the nature of research interview data and of information generated through patient/practitioner interactions in other disciplines. However, there is little research on this key source of data underpinning clinical reasoning and decision-making within physiotherapy.

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**Results:** Analysis found that descriptions of mental/emotional states, thoughts, attitudes, beliefs, and personal conduct served primary communicative functions including improving knee flexion range under weightbearing conditions may facilitate enhanced plasticity in the motor cortex, but does a single intervention:

**Priming the Brain: A Single Bout of Aerobic Exercise Promotes Motor Cortical Neuroplasticity**

**McDonnell MN**, **Buckley JD**, **Opie GM**, **Ridding MC**, **Semmler JG**

1 School of Health Sciences, University of South Australia, Adelaide
2 Nutritional Physiology Research Centre, University of South Australia, Adelaide
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**Results:** Analysis found that descriptions of mental/emotional states, thoughts, attitudes, beliefs, and personal conduct served primary communicative functions including improving knee flexion range under weightbearing conditions may facilitate enhanced plasticity in the motor cortex, but does a single intervention:
Outcome Measures: Cortical excitability was examined each session using transcranial magnetic stimulation to elicit motor evoked potentials in the right first dorsal interosseous muscle. Levels of serum brain-derived neurotrophic factor and cortisol were assessed throughout the experiments. Neuroplasticity within the primary motor cortex was then examined using a continuous Theta Burst Stimulation paradigm.

Results: Exercise did not alter cortical excitability. Following continuous Theta Burst Stimulation, there was a transient inhibition of motor evoked potentials during control and low intensity conditions but this was only significantly different following the low intensity state (p = 0.02). Moderate intensity exercise alone increased serum cortisol levels, but brain-derived neurotrophic factor levels did not increase across any condition.

Conclusion: Low intensity lower limb cycling promoted the neuroplastic response to continuous Theta Burst Stimulation within the area of the motor cortex of healthy adults. These findings suggest that light exercise may be used to prime the brain, or promote widespread changes in the motor cortex and enhance the effectiveness of motor learning or recovery following brain damage.

Key Practice Points:
• A single session of lower limb cycling at low intensity promoted neuroplasticity within the motor cortex of healthy adults
• Increased neuroplasticity may facilitate motor learning and cortical reorganisation following brain injury
• Further research is underway to determine whether exercise to prime the brain can promote recovery following stroke

PHYSICAL ACTIVITY FREQUENCY AND RISK OF INCIDENT STROKE IN THE REASONS FOR GEOGRAPHIC AND RACIAL DIFFERENCES IN STROKE (REGARDS) STUDY
McDonnell MN1, Hillier SL1, Hooker S2, Le A1, Judd SE3, Howard VJ4
1International Centre for Allied Health Evidence, School of Health Sciences, University of South Australia, Adelaide, Australia
2School of Nutrition and Health Promotion, Arizona State University, Phoenix, United States
3Department of Biostatistics, University of Alabama, Birmingham, United States
4Department of Epidemiology, University of Alabama, Birmingham, United States

Question: Adherence to a healthy lifestyle is known to reduce stroke risk, but is self-reported physical activity associated with risk of incident stroke?

Design: Prospective longitudinal study.

Participants: The Reasons for Geographic And Racial Differences in Stroke (REGARDS) study recruited 30,239 blacks (44%) and whites in the United States, aged 45 years or older in 2003 to 2007 who are followed every 6 months for stroke events.

Outcome Measures: Self-reported frequency of moderate-vigorous intensity physical activity according to three categories: none (physical inactivity), 1-3 times/week and ≥ 4 times/week. Stroke cases were identified and adjudicated during an average of 5.7 years of follow-up.

Results: Physical inactivity was reported by 33% of participants and was associated with a hazard ratio of 1.20 (95% confidence intervals 1.02-1.42), p = 0.035). Adjustment for demographics (age, race, sex) and socioeconomic factors did not affect the hazard ratio, but further adjustment for traditional stroke risk factors attenuated this risk (hazard ratio 1.14 [0.95-1.37], p = 0.17). We examined the hazard ratio separately for men and women and found no significant association between physical activity frequency and risk of stroke although there was a trend towards increased risk for men reporting physical activity 0-3 times a week compared to 4 or more times a week.

Conclusions: Self-reported low physical activity frequency is associated with increased risk of incident stroke. Any effect of physical activity is likely to be mediated through reduction of traditional risk factors such as hypertension, body mass index and diabetes.

Key Practice Points:
• The large prospective epidemiological study confirms the importance of undertaking physical activity at least four times a week to significantly reduce the risk of stroke
• Physiotherapists can play a role in promoting healthy lifestyles in our clients with cardiovascular risk factors such as diabetes and hypertension to prevent stroke

MAGNITUDE OF CHANGE IN OUTCOMES FOLLOWING ENTRY-LEVEL EVIDENCE-BASED PRACTICE TRAINING: A SYSTEMATIC REVIEW
Wong SC1, McEvoy MP2, 3, Wiles LK1, Lewis LK1
1Health and Use of Time (HUT) Group, University of South Australia, Adelaide
2International Centre of Allied Health Evidence (iCAHE), University of South Australia, Adelaide

Question: What is the magnitude of change in student outcomes following entry-level evidence-based practice training?

Design: Systematic review of primary studies that investigated the effectiveness of evidence-based practice intervention(s) and reported on, or included data, to allow the calculation of effect size.

Participants: Entry-level health professional students.

Intervention: Evidence-based practice educational intervention(s) including one or more of the five steps of evidence-based practice outlined in the Sicily Statement.

Outcome Measures: Self-reported or actual evidence-based practice outcomes (knowledge, attitudes, behaviours, skills or confidence) reported either as effect sizes, or with sufficient data to enable effect size calculation. Effect sizes were classified as negligible (-0.15 to 0.14), small (0.15 to 0.39), medium (0.40 to 0.74), large (0.75 to 1.09), very large (1.10 to 1.44) and huge (>1.45).
Results: Eight studies with low to moderate risk of methodological bias were included. Effect sizes for evidence-based practice knowledge and skills ranged from small (0.33) to huge (5.42). Four studies exploring attitudes found negligible (0.08) to medium (0.57) effect sizes. Two studies assessing behaviours showed effect sizes ranging from negligible (0.08) to very large (1.34). Very large (0.89) and huge (3.03) effect sizes were reported for confidence with evidence-based practice in two studies.

Conclusion: Considerable and varied improvements were found in students' evidence-based practice knowledge, skills and confidence following training. Changes in attitudes towards evidence based practice were smaller. The reporting of effect size or sufficient data to enable calculation of effect size was poor.

Key Practice Points:
- Few studies reported effect size or data that enabled the calculation of effect size.
- Future studies investigating the effectiveness of evidence-based practice training should report effect sizes to allow meaningful comparison across studies.
- There is a clear need for the development of reporting guidelines for educational interventions and research.

COMPREHENSIVE GAIT ANALYSIS IN PEOPLE WITH MODERATELY DISABLED MULTIPLE SCLEROSIS

McLoughlin J1,3, Barr CJ1, Patritti B1, Crotty M1, Sturniels DL2,3, Lord SR1,3

1Department of Rehab, Aged & Extended Care, Flinders University, Adelaide
2Falls and Balance Research Group, Neuroscience Research Australia, University of New South Wales, Sydney, Australia
3School of Public Health and Community Medicine, University of New South Wales, Sydney, Australia
4Rehabilitation General Hospital, Daw Park, Adelaide

Question: What are the key gait impairments in people with moderately disabled Multiple Sclerosis (MS)?

Design: Comprehensive gait analysis.

Participants: Thirty-two people with moderately disabled MS, 24 females, 50 (±10) years. Expanded Disability Status Scale score 3.6 (±0.6) and ten healthy controls, 7 females, 45.1 (±14.0) years.

Intervention: Participants walked at comfortable pace along a 10 m walkway a minimum of six times.

Outcome Measures: Spatiotemporal, kinematic and kinetic data in the more and less affected legs.

Results: Compared with controls, people with MS had reduced speed (p < 0.001) and increased double support time (p < 0.001). MS also had reduced step length (p = 0.04, p < 0.01), reduced knee power at landing (p = 0.01, p < 0.02) and reduced hip pull-off power (p = 0.02, p = 0.01), reduced plantarflexion at toe-off (p < 0.01, p = 0.02) and reduced ankle push-off power (p < 0.001, p < 0.01) for more and less affected legs respectively. People with MS also had reduced step length (p = 0.04, p < 0.01), reduced knee power at landing (p = 0.01, p = 0.02) and reduced hip pull-off power (p = 0.02, p = 0.01), reduced plantarflexion at toe-off (p < 0.01, p = 0.02) and reduced ankle push-off power (p < 0.001, p < 0.01) for more and less affected legs respectively. People with MS had reduced dorsiflexion in stance (p = 0.03), knee flexion in swing (p < 0.01) and reduced knee flexion power in late swing (p = 0.02) in the more affected leg only.

Conclusion: Comprehensive gait analysis reveals important gait impairments in both more and less affected legs in people with moderately disabled MS.

Key Practice Points:
- People with moderately disabled MS show a number of gait impairments in both more and less affected legs compared to controls. Evidence suggests
- Both sides demonstrate reduced hip flexion pull off and ankle push off power and reduced plantarflexion angle at toe-off – key components for propulsion and speed.
- Reduced knee flexion angle in swing, reduced eccentric knee flexion power in late swing, and reduced dorsiflexion in stance may be the result of more severe upper motor neuron weakness and spasticity in the more affected lower limb.

LAYING DOWN THE TRUTH – SEDENTARY BEHAVIOUR IN PEOPLE WITH COPD WITH PHYSICAL COMORBIDITIES

McNamara RJ1, McKeough ZJ2, McKenzie DK1, Alison JA1,2

1Prince of Wales Hospital, Sydney
2The University of Sydney, Sydney
3Royal Prince Alfred Hospital, Sydney

Question: How much time each day is spent in sedentary activities and sleep? How does this compare to people with COPD without physical comorbidities (COPD + PC)?

How does this compare to people with COPD without physical comorbidities (COPD + PC) and healthy people?

Design: Prospective observational cohort study.

Participants: Seventy-five participants, 25 each with COPD + PC, COPD and no COPD (healthy, age-matched controls).

Outcome Measures: Physical activity was objectively measured using the SenseWear® Pro3 Armband for a period of seven days. METs and physical activity duration were measured every minute.

Results: People with COPD + PC spend a mean (SD) of 20.5 (1.8) hours per day engaged in sedentary activities and sleep. This was significantly greater than the group with COPD (17.6 (2.8) hours per day) and the control group (17.0 (1.5) hours per day) (p < 0.001). Engagement in light intensity physical activity (1.5-3.0 METs) (140 (76) minutes per day) and moderate intensity physical activity (3.0-6.0 METs) (25 (35) minutes per day) in the COPD + PC group was also significantly reduced compared to the COPD (231 (76) and 104 (106) respectively) and control groups (259 (75) and 114 (57) respectively).

Conclusion: People with COPD with physical comorbidities spend a significant portion of their day engaged in sedentary activities and sleep. Strategies for reducing sedentary behavioural should be considered for this population.

Trial registration: ACTRN12608000480381.

Key Practice Points:
- People with COPD with physical comorbidities spend a significant amount of time each day engaged in sedentary activities and sleep (<1.5 METs).
- People with COPD with physical comorbidities engage in less light and moderate intensity physical activity than people with COPD without physical comorbidities and healthy people.
- Strategies to reduce the amount of time spent in sedentary activities by people with COPD with physical comorbidities should be considered in their management.

AQUATIC CARDIOPULMONARY REHABILITATION: EVIDENCE-BASED PRACTICE AND CLINICAL IMPLICATIONS

McNamara RJ1

Prince of Wales Hospital, Sydney

For people with chronic obstructive pulmonary disease (COPD), the use of aquatic therapy as a treatment option has only been documented in research literature in the last decade. In a narrative review, head out of water immersion and exercise in water was found to be feasible, safe and potentially beneficial in people with COPD. More recently, in a Cochrane review and meta-analysis of five randomised controlled trials, water-based exercise training was found to be safe and improves exercise capacity and health-related quality of life in people with mild to moderate COPD immediately following training. However, little evidence exists examining the long-term effects of water-based exercise training. Evidence suggests that a sub-group of people with COPD living with physical comorbid conditions, such as obesity, musculoskeletal and orthopaedic conditions, may respond better to water-based exercise training due to the treatment effect of their physical comorbid in the water environment. Screening for contraindications to water immersion is imperative. Oxygen therapy is not a contraindication to water immersion, but care should be taken to ensure the oxygen delivery device is safely secured and that adequate tubing length and space in the pool is provided. Further considerations should include examination of shortness of breath at rest and on exertion, anxiety, water depth, and the effect of pool chemistry, air and water temperature, and humidity on symptoms. Appropriate exercise prescription and measurement of intensity is crucial for optimal outcomes. Aquatic therapy is safe and effective for people with COPD, especially for those with concurrent physical comorbidities or when the alternative is no exercise training.
PHYSICAL INACTIVITY, HEALTH CONDITIONS AND HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH MUSCULOSKELETAL DISORDERS ACCESSING AMBULATORY HOSPITAL SERVICES

McPhail SM1,2, Schippers M1, Marshall A2
1Centre for Functioning and Health Research, Metro South Health, Brisbane
2Queensland University of Technology, Brisbane

Questions: What is the health profile (body mass index, physical activity levels, co-morbid health conditions and health-related quality of life) of people accessing public hospital ambulatory health services for musculoskeletal disorders?

Design: Cross-sectional study using a quantitative survey.

Participants: A total of 296 community-dwelling patients receiving non-surgical treatment of musculoskeletal disorders through one of three ambulatory hospital services were invited to participate. The response rate was 76% (n = 224).

Outcome Measures: Participants completed a survey consisting of demographic and clinical questions, the Active Australia physical activity survey and the Euroqol-5D-3L health-related quality of life assessment.

Results: Approximately half of participants (n = 110, 49.1%) self-reported physical activity levels that did not meet recommended guidelines. The majority of participants (n = 142, 63.4%) were either overweight (n = 52, 23.2%), obese (n = 76, 33.9%) or morbidly obese (n = 14, 6.3%). More than three co-morbid health conditions were reported by 100 (44.6%) participants.

Conclusion: Findings from this investigation have important implications for the provision of interventions for this population to not only reduce the burden of their presenting musculoskeletal condition, but also underlying lifestyle factors to prevent future disease burden. The overall high prevalence of physical inactivity and weight conditions in patients with musculoskeletal disorders accessing public hospital services suggests that integration of physical activity behaviour change or other lifestyle interventions into models of care, in addition to conventional physiotherapy and multi-disciplinary services, are worthy of consideration.

Key Practice Points:
• People accessing public hospital services for musculoskeletal disorders frequently have an unfavourable health profile.
• Physiotherapists working in this setting should consider opportunities to promote positive lifestyle behaviour change.
• Direct referral pathways to physical activity or other lifestyle behaviour change interventions may reduce the future burden of disease.

DEVELOPMENT AND VALIDATION OF THE ANKLE-FRACTURE OUTCOME OF REHABILITATION MEASURE (A-FORM)

McPhail SM1,2, Williams MC3,4, Schuetz M2,5, Baxter B1, Tonks P1, Haines TP1,2
1Centre for Functioning and Health Research, Metro South Health, Brisbane
2Queensland University of Technology, Brisbane
3Monash University, Melbourne, Australia
4Southern Health, Allied Health Research Unit, Melbourne
5The Princess Alexandra Hospital, Metro South Health, Brisbane

Questions: Which items should be included in a parsimonious ankle-fracture specific patient reported outcome measure; to be known as the Ankle-Fracture Outcome of Rehabilitation Measure (A-FORM)? Do these items have favourable psychometric properties to permit conversion to a single summary score?

Design: Delphi panel and cohort study.

Participants: The Delphi panel included patients and health professionals for item development and wording refinement based on preparatory qualitative research. The cohort component included people who had suffered an ankle fracture (n = 45).

Outcome Measures: Consensus from the Delphi panel was reached on 53 potential items which were then completed by the cohort participants at two possible assessment points to permit preliminary maximum likelihood exploratory factor analysis then Rasch analysis.

Results: From the two time-points, 81 questionnaires were completed and analysed; 39 potential items were eliminated on account of >10% missing data, factor loadings and uniqueness. The 15 unidimensional items retained in the scale demonstrated appropriate person and item reliability after (and before) removal of one item (ankle pain) and a low number of respondents (12, 18%) that had a higher than ideal outfit statistic (1.75). The anxious about footwear item was retained in the instrument but only the 14 items with acceptable infit and outfit statistics (0.5-1.5 range) contribute to the summary score.

Conclusion: This investigation successfully developed and refined the A-FORM (Version 1.0). The A-FORM items demonstrated favourable psychometric properties and are suitable for conversion to a single summary score. Further studies utilising the A-FORM instrument are warranted.

Key Practice Points:
• The A-FORM (Version 1.0) is the first ankle-fracture specific patient reported outcome measure with robust content foundation.
• The 15 A-FORM items were able to be self-completed by people with ankle fractures.
• Responses to the A-FORM items can be converted to a single summary score.

OUTCOME MEASURES: Clinical data, active ROM at initial and discharge therapy assessments, fracture type, surgical approaches and number of therapy sessions attended were recorded.

Results: One hundred and seven (88.4%) cases had complete data sets. The early active ROM group (n = 37) commenced ROM at a mean (SD) of 4.27 (1.8) days post-ORIF. The comparator group (n = 70) commenced ROM exercises at 24.3 (13.6) days post-ORIF. No significant differences between groups were evident for the number of therapy sessions attended or ROM for any direction of movement at the initial or final assessments. Similarly, regression analyses (including the entire sample) did not reveal any significant association between days from surgery until commencement of ROM exercises and ROM at discharge for any direction; extension (p = 0.71), flexion (p = 0.61), pronation (p = 0.87), supination (p = 0.77).

Conclusion: Patients who commenced active ROM exercises an average of 24 days after surgery achieved comparable ROM outcomes with similar number of therapy sessions to those who commenced ROM exercises within the first week. Patients tended to achieve sound ROM outcomes at discharge from therapy regardless of the timing of active ROM commencement.

Key Practice Points:
• Early active ROM commencement seemed safe, but did not lead to improved ROM outcomes or less therapy sessions.
• Early ROM commencement may not be justified when competing interests exist (for example, other injuries).
• Other potential benefits from early mobilisation (for example, earlier return-to-work) were not considered.

TIMING OF ACTIVE RANGE OF MOTION COMMENCEMENT FOLLOWING OPEN REDUCTION AND INTERNAL FIXATION OF DISTAL RADIUS FRACTURES: AN OBSERVATIONAL STUDY

Driessens S1, Diserens-Chew T1, Burton C1, Lassig E1, Buitendag C1, McPhail S2-4
1Logan Hospital, Logan
2Centre for Functioning and Health Research, Metro South Health, Brisbane
3Queensland University of Technology, Brisbane

Questions: Are there any differences in the wrist and forearm range of motion (ROM) outcomes and number of therapy sessions for patients with open reduction and internal fixation (ORIF) of distal radius fractures commencing active ROM exercises within the first seven days (early) versus patients commencing active ROM from day eight onward (comparator)?

Design: Retrospective cohort review.

Participants: Case files of 121 patients with ORIF of distal radius fracture were reviewed.

Outcome Measures: Clinical data, active ROM at initial and discharge therapy assessments, fracture type, surgical approaches and number of therapy sessions attended were recorded.

Results: One hundred and seven (88.4%) cases had complete data sets. The early active ROM group (n = 37) commenced ROM at a mean (SD) of 4.27 (1.8) days post-ORIF. The comparator group (n = 70) commenced ROM exercises at 24.3 (13.6) days post-ORIF. No significant differences between groups were evident for the number of therapy sessions attended or ROM for any direction of movement at the initial or final assessments. Similarly, regression analyses (including the entire sample) did not reveal any significant association between days from surgery until commencement of ROM exercises and ROM at discharge for any direction; extension (p = 0.71), flexion (p = 0.61), pronation (p = 0.87), supination (p = 0.77).

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AGE DID NOT INFLUENCE IMPROVEMENT IN GAIT PERFORMANCE AMONG OLDER ADULTS UNDERGOING IN-HOSPITAL REHABILITATION FOR ORTHOPAEDIC CONDITIONS

McPhail SM1–2, Kuys S3,4, Burgess K4, Varghese P5,6
1Centre for Functioning and Health Research, Metro South Health, Brisbane
2Queensland University of Technology, Brisbane
3Griffith University, Gold Coast
4The Prince Charles Hospital, Metro North Health, Brisbane
5The Princess Alexandra Hospital, Metro South Health, Brisbane
6The University of Queensland, Brisbane

Question: Does age impact improvement in gait performance of older adults undergoing in-hospital rehabilitation for orthopaedic conditions?

Design: Observational study.

Participants: Patients recovering from orthopaedic conditions in three subacute hospital rehabilitation wards (n=1026) participated.

Outcome Measures: Gait speeds were determined from prospective 10m walk tests at admission and discharge assessments. Participants were grouped into one of three categories based on walk performance (category 1=able to complete 10m walk at admission and discharge; category 2=unable to complete 10m walk at admission, but able at discharge; category 3=unable to complete 10 m walk at admission and discharge).

Results: A total of 955(93%) were assessed at both on admission and discharge, and included in analysis. Of these participants, 500(52%) were able to complete the 10m walk at both assessments (Category 1). Their (mean, SD) gait speed was significantly faster (p<0.001) at discharge (0.66m/s,0.27) than admission (0.39m/s,0.22). Regression analysis indicated no association between improvement in gait speed and patient age (r-squared=0.02). A total of 360(38%) patients were unable to complete the 10m walk at admission, but were able at discharge (Category 2); and 55(10%) remained unable to safely walk 10m at discharge (Category 3). Patient age was similar across Categories 1-3 with mean (SD) age of 78.6(11.1), 79.5(11.4) and 79.4(13.6) respectively.

Conclusion: Age did not affect gait performance improvement among this important clinical group. Significant improvement was observed among most patients, regardless of age. These finding do not support the use of age as a selection criterion when considering patient candidacy for subacute rehabilitation.

Key Practice Points:
- Substantial improvement in gait performance occurred for most older adults undergoing hospital rehabilitation for orthopaedic conditions regardless of age.
- Age was not a mediating factor for improvement in gait performance among this clinical group.
- Most (90%) patients safely completed the 10m walk at discharge from inpatient rehabilitation.

LIFE IMPACTS FOLLOWING ANKLE FRACTURES: ANALYSIS OF PATIENT AND CLINICIAN EXPERIENCES FOR DEVELOPMENT OF AN ANKLE-FRACTURE SPECIFIC PATIENT REPORTED OUTCOME

McPhail SM1–4, Dunstan J1, Canning J1, Haines TP5,6
1Centre for Functioning and Health Research, Metro South Health, Brisbane
2Queensland University of Technology, Brisbane
3The Princess Alexandra Hospital, Metro South Health, Brisbane
4Monash University, Melbourne, Australia
5Southern Health, Allied Health Research Unit, Melbourne

Questions: What are the life impacts experienced by patients following ankle fractures?

Design: Qualitative investigation utilizing semi-structured interviews.

Participants: Patient participants were purposively recruited to fill three strata (ratio of 1:1:1) of time since ankle fracture from one to six months, from six months to two years and greater than two years. Twelve people who had previously sustained an ankle fracture (patients) and six health professionals that treat people with ankle fracture participated. Health professional participants included an orthopaedic surgeon (n=1), physiotherapists (n=3), a podiatrist (n=1) and an occupational therapist (n=1).

Outcome Measures: Each participant took part in an in-depth semi-structured interview that was audio-recorded and transcribed. Content units were individually coded, grouped in categories and aligned under emerging themes by two independent researchers.

Results: Information saturation was reached at 10 patient interviews. The time since injury for patients ranged from 6 weeks to more than 2 years. Experience of health professionals ranged from 1 year to 16 years working with people with ankle fractures. The emerging framework derived from patient data included eight themes (Physical, Psychological, Daily Living, Social, Occupational and Domestic, Financial, Aesthetic and Medication Taking). Health professional responses did not reveal any additional themes, but tended to focus on physical and occupational themes.

Conclusion: The nature of life impact following ankle fractures can extend beyond short term pain and discomfort into many areas of life. The findings from this research have provided an empirically derived framework from which a condition-specific patient-reported outcome measure can be developed.

Key Practice Points:
- Life impacts following ankle fractures extend beyond short term pain and discomfort into many areas of life.
- Physiotherapy intervention following ankle fractures should include rehabilitation to address negative life impacts affecting patients, not just clinician identified impairments.
- People recovering from ankle fractures may benefit from multi-disciplinary interventions.

EFFECTIVENESS OF NERVE MOBILIZATION IN THE MANAGEMENT OF SCIATICA

Meena G, Rishikesh G, dharam P

Study objective: To find out whether Nerve mobilization techniques enhance patient outcomes in the management of sciatica when added to the standard care

Design: Pre test Post test experimental design

Setting: Out patient physical therapy department, G.B.Pant Hospital, New Delhi

Subjects: 30 patients, both male and female with a primary diagnosis of sciatica

Measurement: After measuring the baseline pain (NPRS) and functional status (SF-12) scores one group was given conventional physical therapy while the other group was given nerve Mobilization with conventional physical therapy alone.

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Measurement: After measuring the baseline pain (NPRS) and functional status (SF-12) scores one group was given conventional physical therapy while the other group was given nerve Mobilization with conventional physical therapy alone.

Results: Non parametric tests were used to compare the mean statistical difference between the groups. Within group analysis was done using Wilcoxon signed ranks test and between group analyses was done using Mann Whitney U Test. The results showed that there was significant difference in pain and functional status scores as indicated by the significance obtained in their respective p values.

Conclusion: The study results show that neural mobilization techniques when added to standard care enhance patient outcomes in sciatica in comparison to conventional physical therapy alone.
A PRELIMINARY STUDY INTO THE USE OF ANKLE FOOT ORTHOSES IN THE EARLY STAGES OF STROKE

Mehan R, Bradshaw E, Rice V, Brock K, Cotton S
1St. Vincent’s Health, Melbourne, Australia
2Australian Catholic University, Melbourne, Australia
3Oxygen Youth Health Research Centre, Melbourne, Australia

Ankle foot orthoses (AFO’s) are prescribed to patients who have ankle impairments causing difficulty walking following stroke. Evidence regarding the benefit of prescribing AFO’s is controversial.

Question: Does walking performance differ using AFO’s of varying rigidity in the early stages of walking recovery post stroke?

Design: Repeated measures.

Participants: 13 participants (10 male, average age 52.3 years (SD 13.9)) diagnosed with a stroke with an onset of less than 15 weeks.

Intervention: Two baseline conditions; barefoot and shoes, and three AFO’s; push aequi brace, spring leaf AFO and fibreglass casts were tested in counterbalanced order.

Outcome Measures: Walking velocity, double limb support (DLS), single stance times (SST) and affected leg step length (SL) were collected using a GAITRite walkway. Differences across the five conditions were assessed using the Friedman’s test. The ‘smallest real different’ (SRD) measure was used to determine the degree of individual improvement using each AFO compared to shod walking.

Results: No significant differences between for group were identified for shod walking and any of the AFO conditions. Review of the performance of individuals showed improvements beyond SRD for different AFO conditions for five cases for velocity, and one case for DLS. In two cases, walking velocity deteriorated using an AFO.

Conclusion: This study didn’t show benefits from AFO prescription for group data. However, analysis of individual participants demonstrated variable responses both in terms of whether there was improvement with an AFO or type of AFO yielding benefit.

Key Practice Points:
• AFO’s cannot be uniformly recommended for people with ankle deficits in the subacute phase post stroke
• Individuals with stroke have different responses to different types of AFO
• Careful, individualised assessment and reassessment is required to ensure appropriate AFO prescription

RELATIONSHIP BETWEEN AFOS AND DEVELOPMENTAL PROCESSES

Mr Robert Meier1,2
1Kassel Group Inc.
2Consultant to Allard International, Helsingborg, Sweden

Question: Do orthotic interventions help or hinder developmental processes in children with the diagnosis of Cerebral Palsy?


Participants: People with the diagnosis of Cerebral Palsy and other conditions.

Intervention: Ankle Foot Orthoses (AFOs) prescribed to enhance the level of function during gait.

Outcome Measures: Impact AFOs have on temporal-spatial and kinematic data during gait.

Results: The search yielded only 2 systematic reviews. Both reviews agree that the level of confidence in AFO studies is poor, with a lack of standardized terminology, protocols or measurement techniques. No studies were found that address the question of impact that AFOs might have on developmental processes. Additional research was done to determine a hypothetic concept as to how AFOs might impact developmental processes. This search lead to conclusive evidence that immobilization leads to dysfunction of all physiological systems, impaired ossesous development, hinders articulating surface development, leads to abnormal joint modelling and impairs development of motor planning strategies and function.

Conclusion: Evidence supporting the use of pediatric AFOs is limited and inconclusive. Related studies provide guidance in the design of AFOs that would be more appropriate for pediatric populations.

CLINICAL MEASURES OF HIP MUSCLE STRENGTH, FLEXIBILITY AND FUNCTION IN ELITE AUSTRALIAN FOOTBALL LEAGUE PLAYERS

Mendis MD, Battersby D1, Takla A1, Francis D1, O’Donnell J1, Low Choy NL1
1School of Physiotherapy, Australian Catholic University, Brisbane
2Physiologic, Robina, Gold Coast
3Adjunct Appointment, Bond University, Gold Coast
4Nanohoe Sports & Physiotherapy Clinic, Melbourne
5Physioworks Health Group, Melbourne
6Collingwood Football Club, Melbourne
7Hip Arthroscopy Australia, Richmond

Questions: Are there differences in hip muscle strength, flexibility, single leg squat performance and self-reported measures of hip quality of life and function in elite Australian Rules football players with/without positive tests for articular hip pathology? Is hip strength associated with single leg squat performance in football players?

Design: Cross-sectional observational study.

Participants: Fifty-seven elite football players were recruited.

Outcome Measures: The hip quality of life/function questionnaire, clinical measures of hip abduction and external rotation strength (hand-held dynamometers), hip internal and external rotation range (inclinometer) and clinical tests for hip articular pathology (positive/negative) were undertaken. Performances of the single leg squat task were rated against criteria (good, fair, poor).

Results: Clinical measures of strength and flexibility, and single leg squat performances did not differ between players with positive signs for hip pathology compared to those without pain (p > 0.05). Hip quality of life/function scores were significantly lower in players with positive tests for hip pathology on the stance dominant leg (p = 0.03). Stance leg hip abduction strength (p = 0.05) and skill leg hip external rotation strength (p = 0.04) were significantly associated with performances of single leg squat.

Conclusion: While no impairments in strength, flexibility and single leg squat performance were found, players with signs of hip articular pathology on their stance dominant leg reported reduced quality of life/function. Superior single leg squat performances on the stance leg were associated with stronger hip abductor strength while stronger hip external rotation strength was associated with better single leg squat performances on the skill dominant leg.

Key Practice Points:
• Elite football players may require targeted strengthening exercises for hip abductor and external rotators to improve functional stability in single leg tasks.
• Players with clinical signs of hip articular pathology may require further rehabilitation of functional stability.
• Self-report questionnaires may indicate early deterioration in musculo-skeletal function of the hip joint.
ACHIEVING EFFECTIVE AIRWAY CLEARANCE IN A TODDLER WITH CYSTIC FIBROSIS (CF) AND SEVERE INTERSTITIAL LUNG DISEASE

Menere G

Introduction/background:
Two-and-a-half year old boy (Evan) with CF and interstitial lung disease from infancy. He has had twenty-four admissions and has a supportive family. Evan was a term baby with meconium aspiration; required oxygen for 12 days and presented in his first year with pneumonia. CF DFSPB homozygote was diagnosed at five weeks. Pseudomonas and Mycobacterium abscessus were isolated. Required overnight oxygen from one year and home high-flow in second year after a six week admission which required BiPAP. CT scan in Evan’s second year showed almost complete collapse of the left lower lobe, bronchiectasis and partial collapse throughout lungs. Severe gastro-oesophageal reflux lead to failure-to-thrive, gastrojejunosutary tube insertion and fundoplication at two years. He has an unidentified immunodeficiency and poor prognosis with palliative care involvement and full resuscitation status. Evan has received community physiotherapy daily from two years and has airway clearance three times per day. enjoys active play but self limits and communicates non-verbally. Recently, Evan presented with worsening x-ray which showed right periheal collapse and consolidation and hyperinflation. Respiratory rate increased from 50’s-70’s BPM, marked work of breathing, cyanosis, gagging with coughing and diurnal oxygen/high-flow therapy was needed. His cough was initially ineffective, depending on fatigue. His physiotherapy routine was limited due to right-sided chest pain with percussion. Neubulised hypertonic saline caused bronchoconstriction.

Purpose/objective:
Identify the barriers to providing effective chest physiotherapy and therefore identify optimal treatment strategies.

Issues/questions for investigation or ideas for discussion:
How to achieve airway clearance with Evan’s lung pathology? What are the best treatment options for hospital and home?

EVIDENCE OF THE EFFECTIVENESS OF THE MEDIAN NERVE GLIDE FOR THE TREATMENT OF CARPAL TUNNEL SYNDROME. A SYSTEMATIC REVIEW

Meneses JFE

Physiotherapy program, University of Santander, Cúcuta, Colombia

Question: Are median nerve gliding techniques effective (ie, does it reduce symptoms) for the treatment of carpal tunnel syndrome?

Design: Systematic review of randomised trials.

Participants: Subjects (>18 years old) with clinically and electrophysiology evidence supporting the diagnosis of carpal tunnel syndrome.

Intervention: Median nerve glide techniques including clinical neurodynamic techniques and other approaches described by literature such as Maitland concept.

Outcome Measures: Clinical symptoms were measured through median nerve gliding techniques.

Results:
Baseline 14 weeks, 6 months and 12 months.
Secondary outcomes included disability, global perceived effect, health-related quality of life, patient specific functional scale (PSFS) and cervical spine range of motion. Measures were taken at baseline, 14 weeks, 6 months and 12 months.

Results: The two groups were similar at baseline for all outcomes. At all three time points no between-group differences were found for the primary outcome of pain over the last week. The same results were found for all other secondary outcomes except for a statistically significant, though clinically unimportant, benefit for the comprehensive exercise program was found at the 14-week and 6-month follow up for the PSFS and at all time points for the global perceived effect.

Conclusion: A 20-session comprehensive exercise program was found to be no more effective compared to one advice session for people with a chronic whiplash injury.

Trial registration: ACTRN12609000825257.

Key Practice Points:
• No clinically important differences were identified between a 20-session comprehensive exercise program and one, thirty minute advice session for people with a chronic whiplash injury.
• Overall patients in both groups continued to have poor health outcomes following treatment and there is a growing need to identify effective treatments to manage people with a chronic whiplash injury e.g. evaluation of multi-disciplinary rehabilitation programs and pharmacological approaches.

IS A 12-WEEK COMPREHENSIVE PHYSIOTHERAPY EXERCISE PROGRAM MORE EFFECTIVE THAN ADVICE FOR PEOPLE WITH A CHRONIC WHIPLASH INJURY?

Michaleff ZA1, Maher CG1, Lin CWC1, Rebeck T1, Jul G1, Sterling M2

1The George Institute for Global Health, The University of Sydney
2Faculty of Health Sciences, The University of Sydney
3Division of Physiotherapy, The University of Queensland
4Centre for National Research on Disability and Rehabilitation Medicine, The University of Queensland

Question: What is the effect of a 12-week comprehensive physiotherapy exercise program compared to one advice session for people with a chronic whiplash injury?

Design: Randomised controlled trial with concealed allocation, assessor blinding and intention-to-treat analysis.

Participants: 176 participants aged between 18 and 65 years with a chronic whiplash injury (>3 months <5 years duration) and experiencing at least moderate pain or activity limitation.

Intervention: The comprehensive exercise group (specific motor relearning program, graded activity program and educational booklet) received twenty, one hour individually tailored and supervised exercise sessions over a 12-week period. The control group received one thirty-minute advice session and the educational booklet.

Outcome Measures: The primary outcome was pain intensity. Secondary outcomes included disability, global perceived effect, health-related quality of life, patient specific functional scale (PSFS) and cervical spine range of motion. Measures were taken at baseline, 14 weeks, 6 months and 12 months.

Results: The same results were found for all other secondary outcomes except for a statistically significant, though clinically unimportant, benefit for the comprehensive exercise program was found at the 14-week and 6-month follow up for the PSFS and at all time points for the global perceived effect.

Conclusion: A 20-session comprehensive exercise program was found to be no more effective compared to one advice session for people with a chronic whiplash injury.

IS PHYSIOTHERAPY AS A 12-WEEK COMPREHENSIVE PROGRAM MORE EFFECTIVE THAN ADVICE FOR PEOPLE WITH A CHRONIC WHIPLASH INJURY?

Michaleff ZA1, Maher CG1, Lin CWC1, Rebeck T1, Jul G1, Sterling M2

1The George Institute for Global Health, The University of Sydney
2Faculty of Health Sciences, The University of Sydney
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Outcome Measures: The primary outcome was pain intensity. Secondary outcomes included disability, global perceived effect, health-related quality of life, patient specific functional scale (PSFS) and cervical spine range of motion. Measures were taken at baseline, 14 weeks, 6 months and 12 months.

Results: The same results were found for all other secondary outcomes except for a statistically significant, though clinically unimportant, benefit for the comprehensive exercise program was found at the 14-week and 6-month follow up for the PSFS and at all time points for the global perceived effect.

Conclusion: A 20-session comprehensive exercise program was found to be no more effective compared to one advice session for people with a chronic whiplash injury.

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Key Practice Points:
• No clinically important differences were identified between a 20-session comprehensive exercise program and one, thirty minute advice session for people with a chronic whiplash injury.
• Overall patients in both groups continued to have poor health outcomes following treatment and there is a growing need to identify effective treatments to manage people with a chronic whiplash injury e.g. evaluation of multi-disciplinary rehabilitation programs and pharmacological approaches.

PERCEIVED TRAINING AND PROFESSIONAL DEVELOPMENT NEEDS OF AUSTRALIAN PHYSIOTHERAPISTS FOR WORKING WITH OVERWEIGHT AND OBSE CHILDREN

Milne N1, Low Choy N1, Leong G1, Hing W1, Hughes R2

1Faculty of Health Sciences and Medicine, Bond University, Gold Coast, Australia
2Australian Catholic University, Brisbane, Australia
3University of Queensland, Brisbane, Australia

Questions: Are physiotherapists providing services to overweight and obese children and if so what service trends exist? What are the training needs of physiotherapists in this developing clinical area? Are clinical practice guidelines for working with overweight or obese children sought by Australian physiotherapists?

Design: Prospective quantitative and qualitative survey.

Participants: Sixty-four Australian physiotherapists working with children volunteered to participate.
SIMULATED LEARNING IN PAEDIATRIC PHYSIOTHERAPY - TARGETING PAEDIATRIC CAPABILITY IN THE EMERGING WORKFORCE

Kelly K, Wright S, Moller M
Physiotherapy Department, Royal Children's Hospital, Brisbane

Question: Can technology enhanced learning provide standardised, authentic, evidence-based clinical paediatric experiences to increase clinical exposure, engagement and capability in the emerging physiotherapy workforce?

Method: Unique barriers to ensuring physiotherapists have adequate training and experience in paediatrics may impact on sustainability of service delivery into the future. Using an action research methodology, a flexible model for paediatric physiotherapy clinical experience was developed across 3 universities and Queensland's physiotherapy workforce. At pre-registration level, core paediatric principles were identified and integrated into the curricula, extending then into the workforce. E-learning packages including case studies blended seamlessly with simulation to 'scaffold' learning. Best practise and current evidence, supported by subject matter experts, were embedded into the clinical scenarios, targeting specific learning objectives.

Participants: Pre-registration: pre and post graduate students at 3 Queensland Universities (expanding to 6 in 2014). Workforce: Physiotherapists at Queensland tertiary and regional hospitals and health services.

Outcome Measures: Number of Students and workforce receiving simulated learning and evaluation of learning style via Reactionnaire.

Results: 841 participants undertook one or more e-learning packages, 240 students had exposure to clinical paediatric scenarios, 42 physiotherapists in regional centres attended workshops including acute scenarios, all RCH staff completed annual competencies score 4.41/5 for learning style.

Conclusion: This is the first study to investigate the service trends and professional needs of Australian physiotherapists working with overweight and obese children. A large majority of respondents indicate a need for clinical guidelines to best manage this clinical population and attention should consequently be directed towards workforce development strategies in this growing clinical area.

Key Practice Points:
- Childhood overweight/obesity in Australia is high yet limited clinical time is allocated by physiotherapists to this population.
- Less than half of physiotherapists assessed motor skills, despite evidence indicating strong associations between BMI and developments of motor proficiency for overweight/obese children.
- Clinical guidelines for physiotherapists working with overweight/obese children are sought.
INJURY PATTERNS AND RATES AMONGST STUDENTS AT NICA

Munro D

Question. What are the most common types of injuries and injury rates amongst students at NICA (The National Institute of Circus Arts)? What are the most common mechanisms of injury and are there any differences in injury rates based on gender? Once injuries occur, what body areas are the most affected and what types of injuries require the most treatment? Design. Data was collected over an academic year from all student presentations to the physiotherapy staff. Information collected included: mechanism of injury, apparatus involved type of injury, anatomical location, treatment sessions required and gender. Participants. There were 63 full-time students at NICA, across three years levels that formed part of this study, comprising 33 females and 30 males. Results. A total of 1,948 treatments were conducted over the study period. Of these, 18% were for initial/new injuries, and 82% were follow-up sessions. Of the 18% of injuries defined as new injuries, 51% were female and 49% were male. The most common mechanisms of injury (MOI) were: acrobatics (23%), handstands (12%), adagio (11%) and Chinese pole (10%). The most commonly injured body part was the ankle (25%), lumbar spine (14%) and shoulder (12%). Interestingly, however, combined spinal data (cervical, thoracic and lumbar) contributed to 34% of all initial injuries. Females sustained 71% of all hip injuries, but only 33% of all forearm injuries. Males accounted for 59% of all ankle injuries. There were no significant gender-based differences in other body areas. Conclusion. There is no gender based difference in the overall rate of injury for students at NICA. Females, however, sustained significantly higher rates of hip injuries, perhaps reflecting the specific form and style of circus training and contortion undertaken. Similarly, males sustained more forearm and ankle injuries, again likely to be reflective of their general training. Spinal injuries had the highest overall rate of initial and follow-up presentations, suggesting that both preventative and rehabilitative strategies should be addressed. It is suggested that the most common MOIs are reflective of both the high level of time spent training in these areas, and the physical difficulties and demands placed on the body.

PELVIC SUPPORT BELT VERSUS COMPRESSION SHORTS: WHICH IS SUPERIOR IN THE MANAGEMENT OF PREGNANCY RELATED PELVIC GIRDLE PAIN (PGP)?

Moore J, McGlashan G, Oldfield E

Fitwise Physiotherapy

Design: Randomised controlled pilot study with pre-test post-test design.

Participants: Pregnant women with established pregnancy related PGP with reduced force closure.

Intervention: Provision of a pelvic girdle belt or one of 2 different compression shorts, along with other usual care.

Outcome Measures: Pain measured via visual analogue scale (VAS), QOL (bother VAS), PGP questionnaire.

Results: This study is currently on-going but the results will be available by the conference presentation date.

A QUANTITATIVE AND QUALITATIVE EXAMINATION OF THE IMPACT OF HOME MECHANICAL IN-EXSUFFLATION IN CHILDREN WITH NEUROMUSCULAR DISEASE AND THEIR FAMILIES

Moran FC1, Spittle A2,3, Delany C1,4

1Department of Physiotherapy, The Royal Children’s Hospital, Melbourne
2Department of Physiotherapy, Melbourne School of Health Sciences, The University of Melbourne, Melbourne
3Munro Children’s Research Institute, Melbourne
4Children’s Bioethics Centre, The Royal Children’s Hospital, Melbourne


Outcome Measures: Quantitative – device settings/usage; home ventilatory support; number/reason for hospital presentations/admissions; days in hospital/intensive care; type/length of ventilatory support in hospital. Qualitative – interview transcripts which were thematically analysed.

Results: Hospitalisation needs (hospitalised days and time spent invasively and non-invasively ventilated) increased inevitably prior to commencing home mechanical in-exsufflation and reduced following initiation. This trend was less prevalent for participants in later years, indicating a move towards earlier, proactive prescription. Four themes emerged from the parent interviews demonstrating both positive and negative lifestyle implications. Parents became expert in this new treatment. For some the extra care required impacted on the parent/child relationship. Having the device available in the home provided parents with a sense of control over their child’s condition. Data saturation was not reached for child interviews, but developing themes showed children getting used to and ultimate reliance on the device. Home mechanical in-exsufflation resulted in medicalisation of the home but the overall lifestyle impact was positive.

Conclusion: Home mechanical in-exsufflation reduced hospitalisation needs and had both positive lifestyle effects by enabling greater control over illness, and negative effects through medicalisation of the home. Physiotherapists need to consider both the positive and negative implications for the child and family when considering the timing of the introduction of this treatment modality.

Key Practice Points:
- Children/parents should be informed of not only potential health impacts of mechanical in-exsufflation but also lifestyle impacts.
- Parents who are sole users of the device have additional negative lifestyle impacts due to constant reliance on them.
- Parents develop expert status which must be recognised by health practitioners.

PHYSICAL ACTIVITY BEHAVIOUR IN OLDER PEOPLE LIVING IN RETIREMENT VILLAGES

Moran FL1,2, Merom D1, Smith-Merry J1, Davis G1, Kilbreath SL1,2

1School of Science and Health, The University of Western Sydney
2Faculty of Health Sciences, The University of Sydney

Questions: What do people living in retirement villages perceive as barriers to participating in physical activity? Is physical behaviour in older people influenced by type of residence within retirement villages? Design: Mixed methods approach incorporating observational and focus group studies.

Participants: A convenience sample of 20 residents from assisted living (AL) and 20 from self care (SC), currently living in a metropolitan Sydney retirement village.

Outcome Measures: Barrier themes, derived from thematic analysis of focus groups’ transcripts. Physical measures included average steps per hour measured by Sense Wear accelerometer; perceived physical activity measured by International Physical Activity questionnaire (short-form; IPAQ); balance measured by tandem stand test; isometric quadriceps strength measured by cable tensiometer.
**FALLS AND MOBILITY DECLINE IN ADULTS WITH CEREBRAL PALSY: IMPACT ON PERSONAL WELLBEING AND QUALITY OF LIFE**

Morgan Pl, McDonald R²

¹Physiotherapy Dept, Monash University
²Occupational Therapy Dept, Monash University

**Question:** What is the impact of falls and mobility decline in adults with cerebral palsy (CP) on personal wellbeing and quality of life?

**Design:** Mixed methods observational study.

**Participants:** Ambulant community-dwelling adults with CP.

**Intervention:** Postal survey and follow-up semi-structured interview.

**Outcome Measures:** Self-reported falls and mobility decline, personal wellbeing index (PWI), short form 36 (SF-36) health survey. The interview explored impact of mobility decline and falls on participation and quality of life.

**Results:** Thirty adults with CP, mean age 44.6 years, participated with six completing interviews. Twenty-six reported mobility decline. Twenty-four reported >2 falls in previous year. Overall PWI was 65.4 (mean). Those reporting mobility decline scored lower on ‘PWI: personal health’ (p = 0.005), ‘energy/fatigue’, ‘pain’ and ‘general health’ SF-36 domains (p = 0.027, p = 0.005 and p = 0.014 respectively). Those with no/infrequent falls scored lower on ‘PWI: overall’, ‘PWI: standard of living’, ‘PWI: personal safety’ (p = 0.038, p = 0.040, p = 0.015 respectively) and ‘SF-36: role limitations due to overall’, ‘PWI: standard of living’, ‘PWI: personal safety’ (p = 0.038, p = 0.040, p = 0.015 respectively). Twenty-four reported >2 falls in previous year. Overall PWI was 65.4 (mean). Those reporting mobility decline scored lower on ‘PWI: personal health’ (p = 0.005), ‘energy/fatigue’, ‘pain’ and ‘general health’ SF-36 domains (p = 0.027, p = 0.005 and p = 0.014 respectively). Those with no/infrequent falls scored lower on ‘PWI: overall’, ‘PWI: standard of living’, ‘PWI: personal safety’ (p = 0.038, p = 0.040, p = 0.015 respectively) and ‘SF-36: role limitations due to emotional problems’ (p = 0.004). Key themes from interviews were perceptions of physical change; impact of physical change on psychosocial health and quality of life; acceptance of physical change; perceived self-efficacy and resilience.

**Conclusion:** Many adults with CP experience mobility decline and falls. Those reporting mobility decline scored lower on ‘PWI: personal health’ (p = 0.005), ‘energy/fatigue’, ‘pain’ and ‘general health’ SF-36 domains (p = 0.027, p = 0.005 and p = 0.014 respectively). Those with no/infrequent falls scored lower on ‘PWI: overall’, ‘PWI: standard of living’, ‘PWI: personal safety’ (p = 0.038, p = 0.040, p = 0.015 respectively) and ‘SF-36: role limitations due to emotional problems’ (p = 0.004). Key themes from interviews were perceptions of physical change; impact of physical change on psychosocial health and quality of life; acceptance of physical change; perceived self-efficacy and resilience.

**Key Practice Points:**
- Many adults with CP may experience mobility decline and falls.
- Mobility decline may be associated with a less favourable health status and impact on participation and quality of life.
- The impact of falls on health status and quality of life warrants further investigation.

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**DEVELOPMENT AND EVALUATION OF A MODEL TO ENHANCE PHYSIOTHERAPY SKILLS IN PAEDIATRICS – A PRELIMINARY REPORT**

DeValle K, Hough J, Harvey A, Cran F, Morgan P

**Question:** Can a predominantly online educational module address skill deficits in paediatric physiotherapy practice?

**Design:** Pre and post intervention survey.

**Participants:** Recent graduate and more experienced physiotherapists seeking paediatric professional development.

**Intervention:** A web-based curriculum consisting of four weeks of online, case-based content followed by a single face-to-face study day was developed. Support was provided by a remote tutor.

**Outcome Measures:** Participants were surveyed (4-point Likert scale) regarding prior practice experience, and pre and post confidence in delivering physiotherapy services for selected paediatric presentations (plus free text options).

**Results:** Twenty-five participants submitted complete surveys. Prior paediatric experience varied with eleven having <1 month of experience. A significant difference (pre and post responses; p < 0.05) was found in participant confidence in knowledge and ability to independently manage a variety of paediatric conditions, and ability to assess and appropriately treat selected conditions. Prior to the course, self-perceived skill level of novice practitioners compared to more experienced practitioners was significantly different across many paediatric physiotherapy activities (eleven of twenty described, p < 0.005). This difference was ameliorated as a result of course completion, with two of twenty items reflecting significant different difference between groups post course (child with developmental delay, p = 0.004; treatment planning – neurological, p = 0.025).

**Conclusion:** Completion of an educational module in paediatric physiotherapy improves self-perceived confidence in skills, apparent for a range of post-graduate experience. Predominantly online education with support from a remote tutor is an accessible and effective way to deliver professional development in paediatric physiotherapy.

**Practice points:**
- Predominantly online professional development for is a suitable mode of delivery for paediatric physiotherapy up skilling.
- Online professional development can increase practitioner confidence in paediatric skills.
- Participation in an online education course can reduce the difference between perception of confidence in skills between novice and more experienced practitioners.

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**EXTENDED SCOPE PHYSIOTHERAPY SERVICES IN ACT HEALTH DIRECTORATE: KEY STAKEHOLDER PERSPECTIVES**

Morris JH¹, Grimmer K², Ashman BA¹, Bevan V¹, Gilmore LG¹, Kyle G¹, Murphy K¹, Perera E¹, Waddington E²

¹ACT Health, Canberra, ACT
²The International Centre for Allied Health Evidence, The University of South Australia
³The University of Canberra, Canberra, ACT

**Introduction/background:**
Over the past five years, ACT Health has introduced the first formalised extended scope physiotherapy service (ESP PT) in Australia, in Emergency Department (ED) and Orthopaedic Outpatients. The key milestones of the project are; establishing the first national (and international) tertiary training program (including injecting, prescribing, imaging, leadership, research) for physiotherapists interested in working in ESP roles. A second key milestone has been completing the first known trial of physiotherapy prescribing based on a prescribing permit – including protocol-based prescription of simple analgesia and injection of corticosteroids and lignocaine. And thirdly the development and successful implementation of multidisciplinary supervision and mentoring programs for ESP physiotherapists-in-training who have completed formal training.
Purpose/objectives: This PeArL presents reflections of key stakeholders regarding the ESP PT initiative (policy makers, medical sponsors, physiotherapy managers, tertiary education providers (physiotherapy and pharmacology) and regulators of medicines). The PeArL thus presents rare cross-sector insights into key barriers and enablers, implementation strategies, procedures and processes in introducing ESP roles into a health directorate. This information provides a sound platform for considering and implementing further ESP roles.

Issues/questions for investigation or ideas for discussion: The viewpoints presented in this PeArL will underpin wide-ranging cross-sector discussion (eg clinicians, managers, policy makers, educators and researchers) on the value and future of ongoing ESP roles, which could guide other jurisdictions in the safe, effective and efficient roll-out of ESP PT activities.

TRIALLING ONLINE GROUP WORK IN A FINAL YEAR UNDERGRADUATE EVIDENCE BASED PHYSIOTHERAPY UNIT - DOES IT WORK?

Morris S
Curtin University

Questions: How does the use of an online asynchronous collaboration tool (Ocean browser 3) facilitate collaboration and learning in a final year undergraduate physiotherapy student Evidence Based Practice (EBP) group project? How do the students perceive using OB3 compared to face to face group work with respect to collaboration and learning? How do the tutors perceive using OB3 compared to face to face group work with respect to collaboration and student learning?

Design: Action Research

Participants: 96 of the 127 students enrolled in 2013 Physiotherapy Research Unit in the Undergraduate Physiotherapy Program and Curtin University

Outcome Measures: Half hour Student Focus Groups (n=8) held at unit completion; tutor interviews (n=4); Content analysis of Group Discussions in OB3 (n=24)

Results: The median number of discussion comments per week per student ranging from 0 (IQR 0-1) in the second week to a peak of 4 (IQR 2-7) in week 4. Eleven percent of students did not contribute to the discussions at any stage of the project. Students considered online collaboration was “necessary” as the students were time limited and widespread geographically. A face to face group tutorial midway through the project was considered to be a useful adjunct.

Conclusion: This is the first year we have undertaken the undergraduate physiotherapy student Evidence Based Practice (EBP) group project online. The project was deemed successful although improvements in the software such as adding a synchronous component were suggested. The developer has incorporated most of these improvements into the next version of OB3.

Key Practice Points:
• Online Group work facilitates learning in the clinical practice year
• Students participated in discussions and achieved synthesis and independence in the group tasks
• Improvements to the software suggested from this year’s cohort will be integrated into next year’s unit.

THE QUALITY OF REPORTS OF RANDOMISED CONTROLLED TRIALS IN NEUROLOGICAL PHYSIOTHERAPY

Dr Anne Moseley1,2, Dr Mark Elkins1,3,4,5, Ms Lee Janer-Duncan6, Dr Julia Hush7

1 The George Institute For Global Health, Sydney
2 Sydney Medical School, University of Sydney
3 Department of Respiratory Medicine, Royal Prince Alfred Hospital, Sydney
4 Faculty of Health Sciences, University of Sydney
5 Discipline of Physiotherapy, Department of Health Professions, Macquarie University, Sydney

Questions: What is the quality of reports of randomised controlled trials in neurological physiotherapy compared with other areas of physiotherapy? How can trials in neurological physiotherapy be improved?

Design: Survey of reports of trials indexed on the Physiotherapy Evidence Database (PEDro; www.pedro.org.au). Participants:

Intervention: Citation details, language of publication, codes for intervention, codes for subdiscipline of physiotherapy, and the PEDro scale were extracted for all trial reports indexed on PEDro on 9 November 2011. Multiple linear and logistic regressions were used to determine which factors were associated with the total PEDro score and individual PEDro scale items.

Outcome Measures: Total PEDro score and 11 individual PEDro scale items.
HEALTH PROMOTION FOR THE VICTORIAN WHEELCHAIR RUGBY COMMUNITY: EDUCATING UPSTREAM. A THREE-YEAR COMMUNITY ENGAGEMENT EXPERIENCE

Mura C, Ellis S, Hopkinson N, Cracknell C, Hipsher S, Remedios, L
University of Melbourne

Question: How can physiotherapy students influence the health and wellness of a community?

Design: A three-year community engagement project consisting of a literature review of the health determinants; A Health Needs analysis and subsequent health promotion plan.

Participants: Five postgraduate physiotherapy students conducted the engagement experience with the Victorian Wheelchair Rugby community through Disability Sport and Recreation.

Intervention: Based on the health needs analysis findings; the formation of a professional alliance between the Australian Physiotherapy Association and Disability Sport and Recreation; development of an educational webinar to increase physiotherapists awareness of Disability Sport and Recreations’ mission, benefits and referral system and university curriculum changes to educate students about the importance of physical activity in promoting positive health for individuals with disability.

Outcome Measures: Health needs of the community and barriers towards participation.

Results: A significant proportion of individuals with disability are inactive, despite a desire to rectify this. Further, only a small proportion of physiotherapist’s in Melbourne were aware of physical activity programs, with less than 10% having ever referred a patient. The wheelchair rugby community believe that increasing participation and referral is a crucial factor to reduce inequality and promote positive health and wellbeing for individuals with disability.

Conclusion: Every individual has the basic human right to be healthy, which transcends any extra-ordinary circumstances. Problematic participation rates and lack of service awareness creates a substantial barrier towards achieving the overall mission to provide and promote positive health outcomes for Victorian’s with disability via sport and recreation participation.

Key Practice Points:
- Lack of physical activity participation is a prominent factor contributing to health inequality within people with disability.
- Physiotherapists need to have the knowledge of disability sport programs and their referral systems to improve participation within disability sport.
- Student education ensures future physiotherapists are appropriately informed to rectify currently identified inequities.

IDENTIFICATION OF VINCRISTINE ASSOCIATED PERIPHERAL NEUROPATHIES IN CHILDREN WITH ACUTE LYMPHBOlastic LEUKAEMIA

Nathan, EA1,2, Melchiori, T1,3, Campbell, M1,3, Eldridge, B1, Rodda, J1,3
1Physiotherapy Department
2Children’s Cancer Centre (CCC)
3Royal Children’s Hospital Melbourne

Question: Are there screening tests to aid early detection of peripheral neuropathy in children with acute lymphoblastic leukemia (ALL)?

Design: Cross-sectional study.

Participants: Inclusion criteria: six months to 20 years of age, diagnosis ALL, received Vinca Alkaloid 01/01/2010 to 30/10/2011. Exclusion criteria: previously identified neuropathy, pre-morbid neurological/musculoskeletal conditions, period > 1 week Intensive Care, received treatment at multiple organizations.

Intervention: Participants were assessed for peripheral neuropathy (n=50) using range of outcome measures. National Cancer Institute Canada–Common Toxicity Criteria (NCIC-CTC) was graded on 0-4 point scale: 0 indicating no neuropathy through to 4 complete paralysis.

Outcome Measures: Lower limb passive range of movement (ROM), strength, single leg stance (SLS), High Level Mobility Assessment Tool (HiMAT), tempo-spatial measures via GAITRite.

SKILL-BASED ACUTE CARE COMPETENCIES IN PHYSIOTHERAPY USING SIMULATION - THE PARTICIPANTS’ EXPERIENCE

Murphy J1, McAlinden B2
1Mater Health Services
2Mater Health Services

Question: Can a simulated learning environment (SLE) be used to improve clinical reasoning and confidence among physiotherapists who undertake work within the critical care environment?

Design: A qualitative study.

Participants: 11 physiotherapists with varying levels of experience, providing an out of hours service at an acute care tertiary paediatric and adult hospital.

Intervention: Participants completed a pre reading learning package and then participated in a simulation based practical assessment. This assessment consisted of skill stations and an immersive high fidelity clinical risk management scenario.

Outcome Measures: At the conclusion of the program participants completed an evaluation rating their experience.

Results: 100% of participants agreed or strongly agreed that the SLE improved their skill development, self-confidence and clinical reasoning in preparation for out of hours work. 91% agreed or strongly agreed that the environment was realistic. All participants enjoyed the immersive experience.

Conclusion: The SLE provided a safe and realistic opportunity for the development of clinical skills used by physiotherapists in the management of the acutely unwell individual. Simulation also provided an excellent environment for the efficient assessment of competency of practice, as it was not dependent on the availability of appropriate patients as is the case with traditional patient based training programs.

Key Learning Points:
- SLE increases participants confidence
- SLE is realistic and skills can be translated to the clinical environment
- Simulation can be an enjoyable experience.

References:
Results: 30 participants were graded as 1 or higher on NCIC-CTC. All children with 0-1 NCIC-CTC grades had normal ankle strength, whereas children in 2-3 NCIC-CTC group showed reduced dorsiflexion (p ≤ 0.02) or eversion (p < 0.001) strength. The odds that a child who had a NCIC-CTC score of 2-3 being aged 6-13 was 7.4 times higher than being aged 0-5 (95% CI 1.8 to 30.0); and 2.7 times higher than being aged 12-19 (95% CI 0.5 to 14.2). HIIMAT scores were not significant predictors of neuropathy (p = 0.087). ROM, normalized speed, SLS and timing of heel-toe contact were not associated with identification of neuropathy.

Conclusion: A large proportion of participants showed signs of previously undiagnosed neuropathy indicating increased need for clinical surveillance.

Trial registration: HREC31137A

Key Practice Points:

- There needs to be increased clinical screening for identification of peripheral neuropathy given the large proportion of children undergoing treatment for ALL with signs of neuropathy that have never been referred to physiotherapy.
- 6-11-year old age group had a higher proportion of neuropathy and would benefit from increased screening for neuropathy.
- Dorsiflexion and eversion strength are indicative of peripheral neuropathy and as such are key clinical tests to determine the presence of neuropathy.

HOW DO PHYSIOTHERAPY STUDENTS SPEND THEIR TIME ON CLINICAL PLACEMENT?

Nehyba K1,2, Miller S2, Connaughton J1, Singer B4
1Physiotherapy Department, SCGH Perth
2Education Centre, Faculty of Medicine, Dentistry and Health Sciences, UWA Perth
3School of Physiotherapy, UNDA Perth
4Centre for Musculoskeletal Studies, School of Surgery, UWA Perth

Questions: How do physiotherapy students spend their time on clinical placement? Does this differ from how they would like to spend their time? Do different clinical placement models impact on how time is spent?

Design: Prospective observational study.

Participants: Sixty final year physiotherapy students completing a four or five week placement in Western Australia

Outcome Measures: A self-report activity log was used to record time spent in learning activities on one day in the middle weeks of the placement. A written questionnaire and focus groups explored students’ preferred clinical learning experiences.

Results: Students spent the most time treating patients without supervision (median 138 minutes), followed by documentation (median 68 minutes). There was no statistically significant difference in the amount of time students spent in different learning activities between 1:1, 2:1 and 4:1 clinical placement models, although the number of respondents in the 4:1 model was low. Students on collaborative placements recorded more time in peer-assisted learning activities (median 0 minutes). The participants’ preferred clinical learning experience was observation of a therapist treating a patient; however they recorded a median of only five minutes in this activity. Little time was recorded in reflective practice (median 0 minutes).

Conclusion: Students spent the most time in patient care, and much less time in observational and reflective learning activities. Peer-assisted learning opportunities in collaborative clinical placements were minimal. There was no significant difference in the amount of time students spent in various learning activities in the three placement models.

Key Practice Points:

- This study supports the provision of collaborative placement models.
- Consideration should be given to increasing the time spent in observational and reflective learning activities in physiotherapy clinical education.
- Consideration should be given to maximising peer-assisted learning opportunities in collaborative clinical placements.

LUMBO-PELVIC MUSCLE SIZE, SYMMETRY AND FUNCTION ARE RELATED TO PERFORMANCE ON THE SINGLE-LEG SQUAT TASK IN MILITARY RECRUITS

Neill S1, Creaby MW1, Hides JA1, Smith M2
1School of Physiotherapy, Australian Catholic University, Brisbane
2School of Exercise Science, Australian Catholic University, Brisbane

Questions: Is there a relationship between the size, symmetry and function of lumbo-pelvic muscles and performance on the single-leg squat task?

Design: Cross-sectional observational study.

Participants: Forty-six asymptomatic male military recruits.

Outcome Measures: Bilateral real-time ultrasound imaging of lumbo-pelvic muscles (transversus abdominis, internal oblique, lumbar multifidus and quadratus lumborum) captured in standardized positions (supine and prone lying). Muscle thickness, muscle contraction and cross-sectional area measurements were obtained. Performance on the single-leg squat task was rated by mediolateral position of the knee. ‘Appropriate’ performance was classified as knee over foot, and ‘inappropriate’ performance as knee medial to foot.

Results: Inappropriate squat performers were less able to voluntarily contract their ipsilateral (stance leg) multifidus at L3, but had greater contraction ability on the contralateral side (more imbalance between sides), compared to appropriate performers (p = 0.01). For quadratus lumborum, inappropriate squat performers had larger cross-sectional area on the ipsilateral side, as well as more asymmetry between sides compared to appropriate performers (p < 0.03). There were no significant differences in transversus abdominis or internal oblique (p > 0.05).

Conclusion: There was a difference in contraction ability of multifidus at L3 and the cross-sectional area of quadratus lumborum with squat performance. Inappropriate performers had larger quadratus lumborum and less ability to contract multifidus on the ipsilateral versus contralateral side when compared to appropriate performers. Future studies could investigate the effect of addressing multifidus and quadratus lumborum changes on performance of the single-leg squat task.

Key Practice Points:

- Imbalance of lumbar multifidus contraction and asymmetry of quadratus lumborum is evident in young asymptomatic military recruits.
- Performance on the single-leg squat is related to lumbar multifidus function and quadratus lumborum size.
- The causal relationship between muscle size, function and single-leg squat performance, however, is not known.

SIZE AND ASYMMETRY OF THE HIP ABDUCTOR MUSCLES ARE RELATED TO LOWER LIMB FOOTBALL INJURIES

Neill S1, Mendis MD1, Stanton W1, Hides JA1
1School of Physiotherapy, Australian Catholic University, Brisbane

Questions: Is there a difference in gluteus minimus, gluteus medius or piriformis muscle size in football players with or without a lower limb injury? Is asymmetry of these muscles related to pre-season or season lower limb injury incidence?

Design: Experimental study.

Participants: Forty-one male football players were recruited from a professional club and assessed at the start and end of a playing season.

Outcome Measures: Muscle volume of the gluteus minimus, gluteus medius and piriformis muscles measured with magnetic resonance imaging. Injury data for the pre-season and playing season was collected from club records.

Results: Gluteus minimus muscle size was significantly different in players with a season lower limb injury compared to those without (p = 0.04). Players with a pre-season lower limb injury had more asymmetry of their gluteus medius muscles compared to players without injury (p = 0.01). Piriformis muscle asymmetry was related to the interaction between pre-season and season lower limb injury (p = 0.04).

Conclusion: Size imbalances within the hip abductor muscle group exist in players who incur a lower limb injury during the season. Asymmetry of the hip abductor and hip external rotator muscles are related to the incidence of lower limb injury.
WHERE ARE WE GOING WITH ROBOT ASSISTED, PARTIAL BODY-WEIGHT SUPPORTED TREADMILL TRAINING FOR CHILDREN WITH CEREBRAL PALSY?

Nelson R
Child’s Play Physiotherapy

Background: Partial body-weight supported treadmill training provides a relatively safe method of obtaining intense, task specific training for children and its use is well established, but with limited evidence of efficacy for children with cerebral palsy. The paediatric Lokomat, driven gait orthosis, in clinical use since 2006, adds a further dimension by providing lower limb guidance to children walking on a treadmill with partial body-weight support. The Lokomat is an exoskeleton, adjusted to the size of the child and attached via thigh and leg cuffs, with pads to align the pelvis. Integrated computer-controlled miniature motors in the exoskeleton are aligned to each hip and knee joint. These motors are synchronised with the speed of the treadmill and force transducers in each joint measure the interaction between the child and the orthosis. Purpose: Our training and initial experience over the last 6 months using the Lokomat with children in Adelaide has provided a number of insights and prompted even more questions. It has been well accepted by children from four years of age and parents have reported a wide range of positive outcomes, but accessibility is limited by cost, time and travel. We need to be able to advise parents about the appropriateness of this intervention for their child. Ideas for discussion: In this session we will consider which protocols: length, frequency and duration of sessions and timing with life stages and co-interventions, could be most suitable for children of different ages and with different conditions and levels of gross motor function.

Key practice points:
- There is limited evidence to support use of robot assisted body-weight support treadmill training for children with cerebral palsy
- To contribute to the evidence base we need to determine the most appropriate intervention protocols
- Outcomes and intervention protocols may differ for children with different conditions and gross motor abilities

RESULTS:
- CFT resulted in sitting posture and improvements in lower limb muscle endurance
- CFT reduces disability in rowers with LBP
- CFT was effective in reducing pain and disability and improving muscle endurance in adolescent male rowers, supporting the efficacy of this intervention for rowing-related LBP.

NINETY-FOUR PERCENT OF ROBOT ASSISTED PARTIAL BODY WEIGHT SUPPORTED TREADMILL TRAINING PATIENTS REPORTED SIGNIFICANTLY LESS PAIN OVER 15 MINUTES OF EROGOMETER ROWING (NPRS -2.4, 95% CI -4.1 to -0.63, p=0.008) AND REDUCED DISABILITY MAINTAINED TO 12 WEEKS (PSFS 4.1, 95% CI 0.9 to 7.3, p=0.01) AND RMQD (-1.7, 95% CI -2.8 to -0.6, p=0.003) AND DEMONSTRATED GREATER LOWER LIMB ENDURANCE (20.9s, p=0.03) AND POSTURED THEIR LOWER LUMBAR SPINE IN GREATER EXTENSION DURING STATIC SITTING (-9.6°, p=0.007).

Conclusion: CFT was effective in reducing pain and disability and improving muscle endurance in adolescent male rowers, supporting the efficacy of this intervention for rowing-related LBP.

Key Practice Points:
- CFT reduces summation of back pain during ergometer rowing
- CFT reduces disability in rowers with LBP
- CFT resulted in sitting posture and improvements in lower limb muscle endurance

NEW TECHNOLOGIES IN PHYSIOTHERAPY EDUCATION

Ng L1, McLennan R1, Hewitt L2, Turton E1, West T1, Davey P1
1School of Physiotherapy, Curtin University, Perth
2School of Psychology and Speech Pathology, Curtin University, Perth

Questions: How can new technologies improve feedback and reduce staff workload in physiotherapy education?
Design: Quantitative survey design.
Participants: Study 1: Students at Curtin University School of Physiotherapy (n=157) who used electronic subject guides (with video tutorials) in learning first year basic physiotherapy skills. Study 2: Lecturers (n = 5) who graded physiotherapy practical examinations using a newly implemented grading system on tablet computers, which included features such as automatic collation of scores and an ability to provide audio-visual feedback to students (photos and videos).

Outcome Measures: In both studies, participants completed Davis’s (1989) questionnaire to measure the perceived usefulness and ease of use of the new technologies. The measure was adapted to be appropriate to the specific technology that participants used.

Results: Both students and examiners provided positive ratings of the perceived usefulness and ease of use of the new technologies that were implemented.

Conclusion: These studies provide evidence that new technology can be used to deliver material to students in physiotherapy education while the new grading tool can be used to assist with data collation and provide audio-visual feedback to students.

Key Practice Points:
- Electronic guides with audio-visual material is useful in teaching physiotherapy skills,
- Electronic examination marking systems can improve feedback to students,
- These tools can be easy to use in the physiotherapy education setting.

THE VALIDITY OF THREE COMMONLY USED PHYSICAL ACTIVITY QUESTIONNAIRES AS COMPARED WITH ACCELEROMETRY IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Nguyen Q1, Raitlman L2, Haines T1
1Physiotherapy Department - The Alfred, Alfred Health
2Physiotherapy Department – Dandenong Hospital, Monash Health

Questions: Can commonly-used Physical Activity Questionnaires accurately measure the Physical Activity Level in patients with Chronic Obstructive Pulmonary Disease (COPD)?
Design: Criterion-related Validity study.
Participants: Thirty adult (>18 years old) patients admitted to Dandenong Hospital with a principal diagnosis of “exacerbation of COPD”.

Results: Compared to the control group, the CFT group reported significantly less pain over 15 minutes of ergometer rowing (NPRS -2.4, 95% CI -4.1 to -0.63, p=0.008)) and reduced disability maintained to 12 weeks (PSFS 4.1, 95% CI 0.9 to 7.3, p=0.01) and RMQD (-1.7, 95% CI -2.8 to -0.6, p=0.003) and demonstrated greater lower limb endurance (20.9s, p=0.03) and postured their lower lumbar spine in greater extension during static sitting (-9.6°, p=0.007).
STRATEGIES TO FACILITATE EARLY REHABILITATION WITH CRITICALLY ILL PATIENTS

Nickels M, Watson L
Princess Alexandra Hospital, Ipswich Road, Woolloongabba

Strong evidence has been published over the last decade advocating for early rehabilitation to be commenced as soon as possible to counteract the deleterious effects of critical illness and bed rest. However in clinical practice there are many barriers to implementing early rehabilitation with critically ill patients. Physiotherapists can utilise Translational Research Methodology to assist with the implementation of current evidence based research into clinical practice. Translational Research Methodology requires clinicians to understand the problem within the larger healthcare system, create a multidisciplinary improvement team, enlist all stakeholders to identify barriers to change and appropriate solutions and to create a change in practice through engagement, education, execution and evaluation. The application of these strategies within a Queensland tertiary hospital Intensive Care Unit (ICU) to facilitate early rehabilitation with critically ill patients will be presented. Local results from a baseline data collection for a Queensland tertiary hospital ICU, show that a proportion 35% of physiotherapy interventions included one or more elements of active rehabilitation. Results from an ICU staff survey with over 100 respondents indicates there is a polarisation of opinion regarding whether early rehabilitation is beneficial to patient outcomes and whether early rehabilitation is commenced within an appropriate time frame. Suggestions to assist physiotherapists to facilitate early rehabilitation with critically ill patients at local facilities will be provided.

Key Practice Points:
• Translational Research Methodology can be utilised to implement current evidence-based research into clinical practice.
• Physiotherapists can utilise Translational Research Methodology to facilitate early rehabilitation with critically ill patients.
• Engagement of the multidisciplinary team assists to implement changes in clinical practice and culture.

THE ROLE OF EXPERIENCE IN CLINICAL EXPERTISE

Norman G
McMaster University

When asked how long after graduation from their medical specialty before they felt competent in their job, most physicians report 5-10 years. When asked to choose a family physician from two candidates, one who is a recent graduate and a second who has been in practice 10 years, virtually everyone chooses the latter. Paradoxically, studies of recertification and relicensure performance based on written examinations uniformly show a linear drop with years from graduation. Evidently, practical experience is contributing substantially to our perception of competence, but its effects are not detectable by formal examinations.

In this talk, I explore the nature of diagnosis from a cognitive psychology perspective, using an exemplar theory of categorization. I argue from evidence that a major role of experience is to provide the expert with a vast mental storehouse of clinical examples, and the act of routine diagnosis, just like everyday categorization of objects like dogs or trees, proceeds primarily by an unconscious mental similarity matching against a previous example in memory. The careful, systematic, deliberate application of diagnostic rules is a secondary process used for confirmation or when the correct diagnosis is not evident. I discuss the implications for clinical teaching.
**EFFECT OF EXERCISE TRAINING ON VASCULAR HEALTH IN PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE**

**Notebook BJ**1,2,3, Maiorana A4,5, Jenkins S1,3,4,6, Naylor L1, Ng C1,2,3,4,5, Cecins N4,5, Vicary C4,5, Spence A1, Hill KL,2,3,4

1School of Physiotherapy  
2Physiotherapy Department  
3Lung Institute of Western Australia  
4Curtin Health Innovation Research Institute, Curtin University, Perth  
5Advanced Heart Failure and Cardiac Transplant Service  
6Physiotherapy Department, Sir Charles Gairdner Hospital, Perth  
7School of Sport Science, Exercise and Health, University of Western Australia, Perth  
8Community Physiotherapy Services, Perth  
9COPD Community Linkage Service, Royal Perth Hospital, Perth

**Question:** Does a pulmonary rehabilitation exercise program improve vascular endothelial function in people with chronic obstructive pulmonary disease (COPD)?

**Design:** Prospective observational study.

**Participants:** Seven participants with COPD (four females, forced expiratory volume in one second 45 [22]% predicted). Measures are reported as median [interquartile range].

**Intervention:** Participants completed an eight-week pulmonary rehabilitation program comprising at least three training sessions each week (minimum of two supervised sessions) each of one hour duration. The program consisted of aerobic training only or a combination of aerobic and resistance training, with an emphasis on lower limb endurance exercise.

**Outcome Measures:** The primary and secondary outcome measures were ultrasound-derived flow- and nitroglycerin-mediated dilation of the brachial artery and six-minute walk distance, respectively.

**Results:** Wilcoxon signed rank tests were performed to compare measures before and after training. There were no significant changes in any of the outcome measures (all p>0.05). Flow-mediated dilation as a percentage of baseline diameter was 14.3 [16.9] before vs. 10.1 [10.4] after training. Nitroglycerin-mediated dilation as a percentage of baseline diameter was 21.7 [15.6] before vs. 10.1 [10.4] after training. Nitroglycerin-mediated dilation of the brachial artery and six-minute walk distance were not significantly different before and after training.

**Conclusion:** In this small sample, a pulmonary rehabilitation exercise program did not improve endothelial function, a widely accepted marker of atherosclerotic disease risk.

**Key Practice Points:**

- If exercise training improves vascular endothelial function in people with COPD, this may identify a mechanism by which the risk of cardiovascular events can be reduced.

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**THE EFFECTIVENESS OF PRE-OPERATIVE AQUATIC THERAPY FOR HIP AND KNEE JOINT REPLACEMENTS**

**O’Brien C**  
Austin Health

**Question:** What is the effectiveness of aquatic therapy in the pre-operative phase of hip and knee joint replacement surgery? Is aquatic therapy more beneficial than land based therapy?

**Design:** A summary of randomised control trials published between 1993 and 2009.

**Participants:** Subjects aged 63 to 71 with end stage arthritis on a waiting list for hip or knee joint replacement.

**Intervention:** Six to eight weeks of aquatic therapy involving functional, resistance and cardiovascular training in varying water depth.

**Outcome Measures:** Performance based measurements for gait speed, distance and endurance were used. Self-administered questionnaires to measure pain, stiffness, function, general health and quality of life. Various scales were included to measure joint range of motion, functional assessment, pain, muscle strength, deformity and instability.

**Results:** The search located three randomised control trials of moderate to high methodological quality. The trials indicate beneficial effects of aquatic therapy using resistance and cardiovascular training. Improvements were shown in functional ability, hip strength and range, quality of life and pain. Aquatic therapy demonstrated similar outcomes to traditional land based therapy, however there was a greater reduction in pain immediately post aquatic treatment and at eight weeks. Aquatic interventions were not well defined in two of the trials making reproducibility difficult. No adverse events were recorded.

**Conclusion:** Despite a small amount of moderate to high quality publications, positive effects of pre-operative aquatic therapy have been demonstrated, however there is currently no evidence to suggest superiority over land based exercise.

**Key Practice Points:**

- Aquatic therapy has beneficial effects in function and pain reduction
- Aquatic therapy is just as beneficial as land based therapy
- More research is required to determine treatment selection, duration and intensity

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**MOBILISATION ACTIVITIES WHILST ON EXTRACORPOREAL MEMBRANE OXYGENATION: CHALLENGES FOR PHYSIOTHERAPISTS**

**Ntoumenopoulos G**1

1School of Physiotherapy, Australian Catholic University, Sydney  
Physiotherapy Department, Guy’s and St Thomas’ NHS Foundation Trust, Kings Health Partners, London, United Kingdom

Extracorporeal membrane oxygenation may be reserved for patients with refractory hypoxemia and/or hypercarbia [1]. The results of the current randomised controlled EOLIA trial are eagerly awaited (http://www.clinicaltrials.gov/ct2/show/study/ NCT01470703?show_desc=Y&fr=1). Extracorporeal membrane oxygenation does not require specialised critical care units [2, 3] with an appropriately skilled multidisciplinary team and management systems to optimise care and outcomes [1, 4, 5]. Adjustments to extracorporeal membrane oxygenation flow, patient sedation and intravenous fluid management may be needed to optimise oxygen delivery and reduce symptomatic dyspnoea during physiotherapy [6, 7]. There may be the perception that patients on extracorporeal membrane oxygenation may be too unwell or that the extracorporeal membrane oxygenation device may restrict physiotherapy [8]. Early rehabilitation can improve patient functional outcomes during conventional mechanical ventilation [9], but this may also be achieved whilst on extracorporeal membrane oxygenation [8, 10]. This presentation will discuss the type of physiotherapy input feasible during extracorporeal membrane oxygenation. The type of physiotherapy may depend on patient need, acuity, patient participation, global muscle strength, the type of extracorporeal membrane oxygenation circuit (e.g. dual lumen jugular catheter may facilitate ambulation) [8] and tolerance of both the patient and extracorporeal membrane oxygenation device to the activities [10, 11]. We will explore the concept of mobilisation with femoral access devices [12], the oxygen demands to physiotherapy, the adjustments that may be needed to either the extracorporeal membrane oxygenation device and the potential modifications to physiotherapy, to facilitate early rehabilitation.

**References**

A 6-MONTH EXERCISE PROGRAM FOR PEOPLE WITH PARKINSON’S DISEASE: THE PARTICIPANTS’ PERSPECTIVE

Canning CG1, Clemson L1, O’Brien CJ2,3
1The University of Sydney, Sydney
2The University of Canberra, Canberra

Introduction: Physiotherapists have knowledge and evidence about the type of exercises that may assist people with Parkinson’s disease to improve their mobility and balance. However, information is lacking on how to implement such programs effectively.

Question: What factors do people living with Parkinson’s disease believe influence exercise participation?

Design: Qualitative study analysing in-depth semi-structured interviews using grounded theory methodology.

Participants: People living with Parkinson’s disease with cognitive impairment who are living in the community and who had recently completed a disease-specific, physiotherapy-supervised fall prevention exercise program.

Results: Four themes emerged as important in influencing exercise participation for people living with Parkinson’s disease. These are: adapting to change and loss; the influence of others; making meaning of exercise; and hope for the future.

Conclusion: Broader issues need to be considered in order to enhance the relevance, development and implementation of effective and ongoing exercise programs for people with Parkinson’s disease. Some of these issues include: the impact of nonmotor impairments and other health conditions; the exercise group as an opportunity for a shared understanding, competition and comparison with others; and ongoing evaluation of the program by the participants according to their individual goals and expectations.

Key Practice Points:
• Non-motor impairments associated with Parkinson’s disease and other health conditions are barriers to ongoing participation in exercise.
• Exercising with others with Parkinson’s disease is a motivating experience.
• It is important for physiotherapists to understand individual client goals and expectations of an exercise program.

Key Practice Points:
• Intensive locomotor training programs have recently been implemented in paediatric chronic incomplete spinal cord injury but are expensive and time-consuming.
• Lower intensity locomotor programs are more clinically feasible and may provide similar benefits.
• Further studies are required in this area which has limited evidence.

STREAMLINING THE SELECTION OF PATIENTS FOR MANAGEMENT WITHIN THE ORTHOPAEDIC PHYSIOTHERAPY SCREENING CLINIC AND MULTIDISCIPLINARY SERVICE IN QUEENSLAND HEALTH

O’Leary S,1 2 Raymer M,3 Smith D,3 de Pauw M,4 Khan A,4 Hodges P1,3 Jull G1
1NHMRC Centre for Clinical Research Excellence in Spinal Pain, Injury and Health, University of Queensland, Brisbane
2Physiotherapy Department, Royal Brisbane and Womens Hospital, Brisbane
3Physiotherapy Department, Ipswich Hospital, Ipswich
4School of Health and Rehabilitation Sciences, University of Queensland, Brisbane

Questions: The Orthopaedic Physiotherapy Screening Clinic and Multidisciplinary Service (OPSC&MDS) in Queensland Health provide timely coordinated multidisciplinary non-surgical management to patients on orthopaedic waiting lists. To aid the screening role of the service we questioned if specific patient characteristics could identify those patients unlikely to benefit from the service that would have value in a predictive screening model.

Design: Retrospective analysis of medical records of patients managed within the OPSC & MDS at 7 hospital sites between 2008-2010.

Participants: Medical records of 782 patients managed for either low back pain (n = 242), knee osteoarthritis (n = 243), or subacromial impingement syndrome (n = 297) were examined.

Outcome Measures: A logistic regression analysis was used to evaluate the relationship of patient characteristics recorded at the initial assessment with a ‘non-beneficial’ response (failure to achieve minimal clinically important change) to management.

Results: Factors predictive of a non-beneficial outcome included: coexisting cervical or thorax pain (Odds Ratio (OR) 2.11) and ‘low pain self efficacy’ (OR 0.98) for the management of low back pain; ‘high emotional distress score’ (OR 1.03), ‘low knee functional score’ (OR 0.74), and ‘not employed status’ (OR 0.42) for the management of knee osteoarthritis, and co-existing ‘upper limb paraesthesia’ (OR 2.5) and ‘radiological findings of cervical spine degeneration’ (OR 2.4) for the management of subacromial impingement syndrome.

Conclusion: It would appear that specific patient measures may characterise those patients unlikely to benefit from the service, that potentially have value in a predictive screening model.

Key Practice Points:
• Predictive models may assist decision making in clinical practice.
• Patients attending orthopaedic services in secondary health often have multiple factors that may affect their response to non-surgical management.
• Patient characteristics affecting response to non-surgical management may vary between different orthopaedic conditions.

AN OUTPATIENT LOW INTENSITY LOCOMOTOR TRAINING PROGRAM FOR AN ADOLESCENT WITH CHRONIC INCOMPLETE SPINAL CORD INJURY

O’Donnell CM,1 Harvey AR,2 3
1Victorian Paediatric Rehabilitation Service, Royal Children’s Hospital, Melbourne
2Murdoch Childrens Research Institute
3University of Melbourne

Question: Does a low intensity locomotor training program improve functional ambulation after chronic incomplete spinal cord injury in children and adolescents?

Design: Single case study.

Participant: A 17 year-old boy, 16 months after incomplete spinal injury at T6 classified as American Spinal Injury Association (ASIA) level C.

Intervention: The participant completed twice weekly sessions of locomotor training for six weeks.

Outcome Measures: Lower Extremity Motor Score (LEMS), Walking Index for Spinal Cord Injury (WISCI II), 6 minute walk test (6MWT), 10 metre walk test (10MWT), Timed Up and Go (TUG), and the PedsQL were measured before training, immediately after training and six weeks after training had ceased.

Results: Improvements were seen in the WISCI II with change from 5 (walking for 10 metres with minimal assistance with a walker) to 9 (ambulating ten metres independently with a walker) immediately post treatment and this was maintained at follow up. He was also able to sit to stand independently (OR 0.42) and ‘not employed status’ (OR 0.42) for the management of knee osteoarthritis, and co-existing ‘upper limb paraesthesia’ (OR 2.5) and ‘radiological findings of cervical spine degeneration’ (OR 2.4) for the management of subacromial impingement syndrome.

Conclusion: This case study provides evidence of improvements following a low intensity outpatient locomotor training program for an adolescent. Studies with larger samples are required to fully examine the benefits of programs with this level of intensity.
DIFFERENTIAL CHANGES IN MUSCLE COMPOSITION EXIST IN TRAUMATIC AND NON-TRAUMATIC NECK PAIN

O’Leary S1,2, Elliott J3,4, Pedler A3, Jul1 G, Van Wyk L1, Gallaway C5
1 NHMRC Centre for Clinical Research Excellence in Spinal Pain, Injury and Health, University of Queensland, Brisbane
2 Physiotherapy Department, Royal Brisbane and Womens Hospital, Brisbane
3 Northwestern University, Feinberg School of Medicine, Department of Physical Therapy and Human Movement Sciences, Chicago, USA
4 School of Health and Rehabilitation Sciences, University of Queensland, Brisbane
5 Centre of National Research on Disability and Rehabilitation Medicine, Royal Brisbane and Women’s Hospital, Brisbane

Questions: What are the relative constituents of viable muscle in 2-dimensional cross sectional area (CSA) measures of ventral and dorsal cervical muscles in patients with chronic whiplash, idiopathic neck pain, and healthy controls.

Design: A population based cross-sectional study.

Participants: 136 females participated, including 79 with chronic whiplash, 23 with chronic idiopathic neck pain, and 34 healthy controls.

Outcome Measures: MR images of CSA were obtained for 14 cervical muscle regions (4 ventral, 6 dorsal). T1-weighted MR sequences provided images of reasonable tissue contrast between fat and soft-aqueous skeletal muscle, to compare total relative CSA (rCSA) and relative muscle CSA (rmCSA) (fat removed) of the 14 muscle regions.

Results: Without fat removed, rCSA of 7/14 muscle regions in the WAD participants were larger, 3/14 smaller and 4/14 similar to healthy individuals. When T1-weighted signal representing the lipid content of these muscles was removed, 8/14 rmCSA in patients with whiplash were similar, 5/14 were smaller and 1/14 larger than those observed in healthy controls. Removal of fat from the rCSA measurement did not alter findings between participants with idiopathic neck pain and healthy controls.

Conclusion: These findings clarify that previous reports of increased rCSA in patients with chronic whiplash represent cervical muscle pseudo-hypertrophy. rmCSA measures reveal atrophy in several muscles in both patients with WAD and idiopathic neck pain which supports inclusion of muscle conditioning in the total management of these patients.

Key Practice Points:
• Measurement of rmCSA may be more representative of viable muscle tissue.
• These morphological changes may have implications for the force generating capacity of these muscles.
• These morphological changes warrant further investigation of targeted muscle exercise in the total management of these patients.

A SYSTEMATIC REVIEW OF DRY NEEDLING/ACUPUNCTURE FOR THE TREATMENT OF PEOPLE WITH PHANTOM LIMB PAIN

O’Neill P
Northern Health

Question: Is needle acupuncture or dry needling an effective treatment for people with phantom limb pain following major limb(s) amputation?

Design: A systematic review of papers published between 1972 and 2012 presented in a narrative format.

Participants: All people with phantom limb pain following a single or multiple major upper or lower limb amputation treated using needle acupuncture or dry needling.

Intervention: Needle acupuncture or dry needling only or combined with electro-acupuncture.

Outcome Measures: Pain measures.

Results: Nine papers describing single or multiple case studies of low to moderate levels of quality were identified. A total of 21 participants were included. Seventeen participants had lower limb amputations, three participants had upper limb amputations and one had quadriple amputations. Most participants had amputations caused by cancer or trauma and two participants had a vascular cause of amputation. Nine described dry needling techniques. All used traditional Chinese medical points sometimes with a western clinical reasoning model. Six studies used needles only and three combined acupuncture needles with electro-acupuncture. Papers used either visual analogue or numerical rating scales, reporting results of six patients with no pain, nine patients with a reduction of pain, four studies were unclear and two patients had no change. Follow-up was mostly for the duration of treatment (up to 10 weeks).

Conclusion: There is insufficient evidence that acupuncture or dry needling is an effective treatment for the treatment of phantom limb pain following major limb amputation. There is a need for further high level research with long term evaluation.

Key practice points:
• Low to moderate quality case studies found a reduction in phantom pain with needle acupuncture treatment.
• There is insufficient evidence to support the use of dry needling/needle acupuncture as an effective treatment for phantom limb pain.
• Further high level research is indicated.

CLASSIFICATION BASED COGNITIVE FUNCTIONAL THERAPY FOR NONSPECIFIC CHRONIC LOW BACK PAIN: WHAT EXPLAINS THE REDUCTIONS IN DISABILITY?

Vibe Fersum K1, Smith A2, Kvale A1, Skoene S1, O’Sullivan P2
1 Bergen University, Bergen, Norway
2 Curtin University, Perth, Australia

Peter O’Sullivan is a Professor at the school of Physiotherapy at Curtin University and Specialist Musculoskeletal Physiotherapist at Bodylogic Physiotherapy West Australia.

Question: What factors explain the reduction in disability in subjects with nonspecific low back pain who underwent a classification based cognitive functional therapy intervention?

Design: A randomized controlled trial with 12 month follow-up investigated the efficacy of cognitive functional therapy versus manual therapy and exercise. Follow-up data demonstrated large effects for reductions in disability in favour of cognitive functional therapy. A secondary analysis was conducted to investigate mechanisms for the change in disability following the intervention using multiple regression analysis.

Participants: 121 subjects with nonspecific chronic low back pain were randomized to two groups

Outcome Measures: Changes in pain intensity levels, fear avoidance (activity and work), mood and pain coping.

Results: There was a significant positive relationship between reduced disability and decreased pain intensity (r=-.727, p<.001), decreased work-related fear (r=-.380, p=0.007), improved mood (r=.448, p<.001) and improved coping (r=.520, p<.001) in the cognitive functional therapy group. Decrease in pain intensity correlated significantly with improved pain coping (r=-.297, p=0.028), which was unique to the cognitive functional therapy group. In multiple regression, decreased pain uniquely explained 30.3% (semipartial R² = .303 p < 0.001) of variance in change in disability, and improved mood uniquely explained 4.4% (semipartial R² = .044, p=0.019).

Conclusions: The large reduction in disability for the cognitive functional therapy intervention was most strongly explained by reductions in pain intensity and pain coping. These findings support the aim of cognitive functional therapy, of providing people with nonspecific chronic low back pain, pain coping strategies in order to enhance functional capacity.

Key Practice Points:
• Pain reduction, improved pain coping, reduced fear and improved mood explained the large reductions in disability for the cognitive functional therapy group.
• Improved pain coping was unique to the cognitive functional therapy group.
• These findings support the multi-dimensional nature of cognitive functional therapy.

A systematic review of dry needling/acupuncture for the treatment of people with phantom limb pain.
DOES AQUATIC PHYSIOTHERAPY REDUCE LOW BACK/PELVIC GIRDLE PAIN DURING PREGNANCY?

Oaten C1,2,3,4, Orr RM
1 Eastern Health
2 The Gully Physiotherapy Clinic
3 Knox Hydrotherapy Service
4 PhysioSpot

Question: Does aquatic physiotherapy reduce low back/pelvic girdle pain in pregnant women?


Participants: Women in the antenatal population at 19 weeks gestation or later with pregnancy-related pelvic girdle pain (PGP) and/or pregnancy-related low back pain (PLBP).

Intervention: Therapeutic aquatic exercise designed by physiotherapists for the antenatal population.

Outcome Measures: Visual analogue scale for pain, number of days sick leave taken due to PGP/PLBP, Smith’s Pregnancy Discomfort Intensity Index (SPDI).

Results: The search yielded: one randomized controlled trial (type II evidence); one pseudo-randomized controlled trial (type III-1 evidence) and one non-randomized experimental trial (type III-2 evidence). The level II evidence showed that women who perform aquatic exercise prescribed by a physiotherapist throughout pregnancy experience a statistically significant reduction in PLBP and PGP and take less sick leave due to PGP/PLBP during the antenatal and immediate post-partum period than women who do not. The rigour of the remaining studies was found to be low due to poor control of bias and threats to internal validity reducing their applicability to general clinical physiotherapy practice.

Conclusion: The current body of evidence supporting the effectiveness of aquatic physiotherapy in reducing LBP/PGP during pregnancy is incomplete. Additional high quality RCTs with large sample sizes utilising valid and reliable outcome measures are needed to strengthen the existing evidence for aquatic physiotherapy in the management of PGP/PLBP in the antenatal population.

Key Practice Points:
- Pregnant women who perform aquatic exercise prescribed by a physiotherapist experience less PGP/PLBP when compared to women who do not exercise.
- Pregnant women given aquatic exercises from a physiotherapist take less sick leave due to PGP/PLBP.
- The current body of evidence for using aquatic physiotherapy in the antenatal population with PGP/PLBP is incomplete and would be strengthened with additional high quality trials.

GRIP STRENGTH IS ASSOCIATED WITH MARKSMANSHIP AND DEFENSIVE TACTICS, BUT NOT INJURIES, IN POLICE RECRUITS

Orr RM1, Sterell M2, Hinton B3, Steele M2
1 Bond University, Gold Coast, Australia
2 New South Wales Police Force, Sydney, Australia

Questions: How important is grip strength in police recruits?

Design: A longitudinal cohort study.

Participants: New South Wales police recruits.

Outcome Measures: Dominant hand grip strength measured with a grip dynamometer, marksmanship performance with a 9mm Glock pistol measured by target scores, defensive tactics performance as determined by training instructors and injury results as recorded on the police injury database.

Results: Data from two recruit cohorts (Session 1 n=50; Session 2 n=169) were captured. Mean grip strengths were 43.6 kg (±10 kg) and 42.2 kg (±8 kg) for Session 1 and Session 2 respectively with no significance between groups (p=0.287). Of the combined cohorts 26% (n=56) sustained an injury/illness. During Session 2, 12% (n=27) failed defensive tactics and 32% (n=70) failed their initial marksmanship shoot. There was no significant correlation between grip strength measures and injuries/illness (r=0.126, p=0.63). A moderate, significant correlation was found between grip strength and marksmanship (r=0.419, p<0.001) with a weak but significant correlation found between grip strength and defensive tactics performance (r=0.277, p=0.03).

Conclusion: Grip strength may not predict injury risk in police officers undergoing recruit training. Grip strength may play a role in the marksmanship and defensive tactics performance of police recruits, however its relationship with these tasks is not strong enough to provide a predictive value.

Key Practice Points:
- Grip strength may influence a police recruit’s marksmanship and defensive tactics performance.
- Optimising grip strength following injuries that affect a police recruit’s grip strength is important.
- Grip strength may be a useful outcome measure in return-to-training planning for police officer recruits undergoing treatment for upper limb injuries.

INJURIES SUSTAINED BY AUSTRALIAN REGULAR ARMY SOLDIERS WHILE CARRYING OCCUPATIONAL LOADS

Orr RM1, Pope R2, Johnston V3, Coyle J4
1 Bond University, Gold Coast, Australia
2 Charles Sturt University, Albury, Australia
3 University of Queensland, Brisbane, Australia

Questions: What injuries do army soldiers sustain while carrying occupational loads?

Design: A Cross-Sectional Study.

Participants: Australian Regular Army personnel.

Outcome Measures: Self-reported injuries sustained during load carriage activities over a two-year period as recorded on the Australian Defence Force Occupational Health, Safety and Compensation Analysis and Reporting database.

Results: Responding to a survey of load carriage injuries, 338 respondents reported 194 load carriage injuries over their careers. On the health, safety and compensation database 404 load carriage injuries, among approximately 26, 500 army personnel, were recorded over two years. The lower limbs were the leading injury site (self-reported n = 118 [61%]; database n = 195 [56%]) followed by the back (self-reported n = 52 [27%]; database n = 92 [26%]). Bones and joints were the most frequently injured body structures (self-reported n = 76 (39%)) followed by muscles and tendons (self-reported n = 70 [36%]). Of the 48% (n = 56) of respondents who reported suffering a load carriage injury during initial training, 32% (n = 18) reported sustaining an additional injury within 12 months. No significant difference in the distributions of aggregated body injury sites, between survey respondent injury data and database data was found, χ²(6) = 3.90, p = 0.31.

Conclusion: Load carriage activities performed by soldiers have led to self-reported and recorded injuries predominantly to the lower limb or back, with bones and joints accounting for the most frequently reported injured body structures.

Key Practice Points:
- Soldier load carriage tasks present as a significant injury risk.
- A soldier’s load carriage requirements must be taken into account when they are undergoing treatment for a musculoskeletal injury.
- Soldiers who have sustained a load carriage injury may be at an increased risk of re-injury during subsequent load carriage tasks.
EARLY INTERVENTION EXPERIENCES OF VERY PRETERM CHILDREN UP TO TWO YEARS – THE LUCKY DIP

Orton JL1,2
1 The Royal Women’s Hospital, Melbourne
2 The University of Melbourne, Melbourne

Aim: To describe the rates of early intervention for a cohort of preterm infants and examine factors that influence the receipt of intervention. Background: Preterm infants are at increased risk for developmental delay or disability and timely referral to and receipt of early intervention is important. There is little information available regarding access to intervention for preterm infants in Australia.

Methods: A retrospective audit was performed with data collected at two years from 80 preterm children from the Royal Women’s Hospital. Predictors for receiving intervention were neonatal risk characteristics and developmental delay. A parent report questionnaire was also sent to families. Development was assessed using the Bayley-III.

Results: The overall rate of receipt of intervention during the first two years was 68%. Rates of intervention for children were 80%, 75% and 70% for moderate to severe cognitive, language and motor delay respectively. Children with lower birthweight and with more severe delays were significantly more likely to receive intervention. Families were most commonly referred to intervention by allied health on discharge from hospital (71%). Waiting times were variable and 27% of infants waited more than 12 months for therapy service.

Conclusions: There was an unmet need for early intervention for preterm infants in all domains and categories of delay across the Bayley-III. Early intervention was better targeted to children with more severe delay however children with no delays also received intervention. Given the many demands on funding and services in the Early Childhood Services sector, there is a need for improved targeting of services to infants or children with delays.

THE EFFECT OF POSITIVE EXPIRATORY PRESSURE FOR AIRWAY CLEARANCE ON VENTILATION INHOMOGENEITY IN INDIVIDUALS WITH STABLE COPD AND CHRONIC SPUTUM EXPECTORATION

Osadnik CR1, Stuart-Andrews C1, Ellis S3, Thompson BP2, McDonald CF4,5, Holland AE1,6
1 School of Physiotherapy, La Trobe University, Melbourne
2 Allergy, Immunology and Respiratory Medicine, Alfred Health, Melbourne
3 Department of Radiology, Alfred Health, Melbourne
4 Department of Respiratory and Sleep Medicine, Austin Health, Melbourne
5 Institute for Breathing and Sleep, Austin Health, Melbourne
6 Department of Physiotherapy, Alfred Health, Melbourne

Question: Does positive expiratory pressure via mask improve ventilation inhomogeneity and increase functional residual capacity more than controlled huffing and coughing?

Design: Prospective, randomised, cross-over trial with concealed allocation, assessor blinding and intention-to-treat analysis.

Participants: Twelve participants with stable COPD (mean FEV1 45% predicted) and chronic sputum expectoration.

Intervention: Positive expiratory pressure therapy (10–20 cm H2O) or controlled huffing and coughing were performed in random order on separate days.

Outcome Measures: Measures of acinar and conductive airways ventilation (Sa, Sb) lung volumes, spirometry and sputum weight were recorded before, immediately after and 90 minutes following treatment. Ease of expectoration (visual analogue scale, higher = worse) and oxyhaemoglobin saturation were assessed immediately following treatment.

Results: No statistically significant between-group differences were observed at any time for symptom severity (p = 0.98), quality of life (p = 0.87), length of stay (p = 0.59), incidence of exacerbations (p = 0.99) or hospitalisations (p = 0.36). The experimental group showed a more rapid improvement in dyspnoea (p = 0.01) and exercise tolerance (p = 0.052, non-significant) over the first eight weeks, however these benefits were not observed at six months.

Conclusion: Performing positive expiratory pressure therapy during acute exacerbations of COPD does not affect important short-term or long-term clinical outcomes. Its role in the management of such individuals does not appear to be routine.

A MULTI-CENTRE, RANDOMISED CONTROLLED TRIAL OF POSITIVE EXPIRATORY PRESSURE THERAPY FOR INPATIENTS WITH ACUTE EXACERBATIONS OF COPD AND SPUTUM EXPECTORATION

Osadnik CR1,2, McDonald CF2,3, Miller BR4, Hill CE5, Tarrant BS, Steward R5, Chao C1, Stodden N5, Oliveira C1, Gagliardi N6,7, Holland AE1,6
1 School of Physiotherapy, La Trobe University, Melbourne
2 Institute for Breathing and Sleep, Austin Health, Melbourne
3 Department of Respiratory and Sleep Medicine, Austin Health, Melbourne
4 Allergy, Immunology and Respiratory Medicine, Alfred Health, Melbourne
5 Department of Physiotherapy, Austin Health, Melbourne
6 Department of Physiotherapy, Alfred Health, Melbourne

Question: Does the addition of positive expiratory pressure therapy to usual care improve symptoms, quality of life or incidence of future exacerbations in inpatients with an acute exacerbation of COPD?

Design: Multi-centre, randomised controlled trial with concealed allocation, assessor blinding and intention-to-treat analysis.

Participants: 90 inpatients (58 male; mean age 68.6, FEV1 40.8% predicted) with acute exacerbations of COPD and sputum expectoration.

Interventions: Usual medical care including physical exercise or same plus positive expiratory pressure therapy 3 times/day until discharge or non-productive cough.

Outcome Measures: The primary outcome was self-reported symptom severity, measured by the Breathlessness, Cough and Sputum Scale. Secondary outcomes were quality of life (St. George’s Respiratory Questionnaire), hospital length of stay, exacerbations, hospitalisations and BODE index (Body mass index, airflow Obstruction, Dyspnoea, Exercise tolerance). Participants were assessed at discharge, eight weeks and six months following discharge.

Results: No statistically significant between-group differences were observed at any time for symptom severity (p = 0.98), quality of life (p = 0.87), length of stay (p = 0.59), incidence of exacerbations (p = 0.99) or hospitalisations (p = 0.36). The experimental group showed a more rapid improvement in dyspnoea (p = 0.01) and exercise tolerance (p = 0.052, non-significant) over the first eight weeks, however these benefits were not observed at six months.

Conclusion: Performing positive expiratory pressure therapy during acute exacerbations of COPD does not affect important short-term or long-term clinical outcomes. Its role in the management of such individuals does not appear to be routine.

Trial registration: NCT01101282.

Key Practice Points:

1. Positive expiratory pressure therapy does not improve important clinical outcomes in this patient group.
2. No prospective factors strongly predict symptom improvements at discharge.
3. The risk of adverse events in this patient group is low; irrespective of whether positive expiratory pressure based airway clearance therapy is performed or not.

Key Practice Points:

1. The mechanism to explain how positive expiratory pressure may benefit sputum clearance in individuals with COPD remains unconfirmed.
2. Any physiological effects of positive expiratory pressure do not appear to endure after treatment is ceased.
3. The physiological rationale for prescribing positive expiratory pressure in this patient group may need reconsideration.
THE EFFECT OF SURGICAL MAGNIFICATION (LOUPES) ON NECK PAIN AND DISABILITY AMONG DENTAL HYGIENISTS

Hayes MJ, Osmotherly PG, Taylor JA, Smith DR, Ho A
School of Health Sciences, The University of Newcastle, Australia

**Question:** Does the use of loups affect the level of neck pain and disability experienced by dental hygienists?

**Design:** Exploratory pre-test post-test study.

**Participants:** Twelve practicing dental hygienists experiencing musculoskeletal symptoms compared with 17 final year dental hygiene students.

**Intervention:** Individually fitted Galilean loups in 2.5x magnification used by the practicing hygienist group over 6-months.

**Outcome Measures:** Neck pain and disability scale (NPDS), craniovertebral angle, cervical range of movement (CROM), deep neck flexor muscle endurance and cervical joint position error were analysed by mixed ANOVA's with time and treatment as independent variables.

**Results:** No significant interactions between time and treatment were evident. In the treatment group, mean NPDS scores did not alter. Modest improvements over time were noted in cervical range of motion and deep neck muscle endurance. Deterioration was noted for forward head posture and cervical kinaesthetic sense. Cervical range of movement and deep cervical flexor muscle endurance reduced in the comparison group.

**Conclusion:** This is the first study to objectively assess the impact of surgical magnification on neck pain and disability among practicing dental hygienists. The findings suggest that wearing loups has both positive and negative outcomes in regard to objective measures of cervical function.

**Key Practice Points:**

- Physiotherapy outcome measures can be used in occupational research.
- Loups may result in improvement in some measures of cervical spine function but appeared to reduce ability to sense position and movement.
- No single intervention may be effective in limiting musculoskeletal disorders in the dental professions.

THE CONSTRUCT VALIDITY OF THE ANTERIOR SHEAR AND DISTRACTION TESTS FOR CRANIOCEVICAL INSTABILITY

Osmotherly PG, Rivett DA, Rowe LJ
School of Health Sciences, The University of Newcastle, Australia

**Question:** Can a direct measureable effect on the transverse ligament and tectorial membrane be demonstrated upon application of the anterior shear and distraction tests for craniocevical instability? Is this consistent with published descriptions of the tests?

**Design:** Within-participant experimental radiological study.

**Participants:** Sixteen people between the ages of 19 and 38 with no known neck problems.

**Intervention:** Participants underwent magnetic resonance imaging in supine in neutral and end-range test positions. Proton density-weighted sequences were obtained using a standard head coil in a 3-Tesla system.

**Outcome Measures:** The anterior shear test was assessed using changes in atlantoaxial interval and distance from the anterior arch of the atlas to the posterior aspect of the odontoid process. Distraction testing for the tectorial membrane was assessed by changes in basion-dental interval and by direct measurement of the tectorial membrane. Differences were compared using Wilcoxon Sign Rank test or paired t-test. Reliability of measurements for each image was assessed by estimation of ICCs.

**Results:** Anterior shear testing resulted in a 0.41mm mean increase in atlantoaxial interval ($p = 0.03$) and a 0.35mm mean increase in axial plane distance ($p = 0.05$). Distraction testing for the tectorial membrane resulted in a 0.64mm increase in basion-dental interval ($p < 0.01$) and a 1.11mm increase in direct ligament length measurement ($p = 0.02$). Reliability of measurements ranged from 0.74 to 0.99.

**Conclusion:** The screening tests examined produced a direct effect on the transverse ligament and the tectorial membrane consistent with their theorised clinical mechanism, providing support for their construct validity.

**Key Practice Points:**

- Displacement of the atlas on the axis can be produced manually during the anterior shear test for the transverse ligament.
- Distraction of the occiput from a fixed axis produces an increase in length of the tectorial membrane.
- Questions regarding magnitude of clinically meaningful change remain unresolved.

THE RELATIONSHIP BETWEEN CERVICAL SPINE ANTHROPOMETRICS, RANGE OF MOVEMENT AND STRENGTH IN ELITE RUGBY PLAYERS

Harrison JL, Osmotherly PG, Snodgrass SJ, Rivett DA, Reid S
School of Health Sciences, The University of Newcastle, Australia
Australian Catholic University, Sydney, Australia

**Question:** Are measures of neck length and circumference associated with muscle strength and range of cervical spine motion in rugby forwards?

**Design:** Cross-sectional study.

**Participants:** One hundred and forty two rugby forwards from six NSW Premiership Rugby clubs.

**Outcome Measures:** Measurements made followed a standardised protocol that linked anthropometric dimensions with measurements of strength and range of motion. With the use of a standard tape measure, neck circumference was taken immediately superior to the thyroid cartilage, anterior column length measured from the point of the chin to sternal notch and the posterior column length at the external occipital protuberance to the spinous process of C7. Strength was measured using an isometric dynamometer. Range of movement was measured with a Polhemus liberty tracking device. Correlations were examined using Spearman’s rank test.

**Results:** Statistically significant correlations were found between BMI and strength measures of flexion ($r = 0.28$), left and right rotation ($r = 0.35$), left and right lateral flexion ($r = 0.44$ and 0.43 respectively) and between neck circumference and strength of left and right rotation ($r = 0.26$ and 0.37) and left and right lateral flexion ($r = 0.37$ and 0.36). Range of movement demonstrated little or no correlation with anthropometric measures.

**Conclusion:** A weak but positive relationship was determined between BMI and neck circumference and neck strength. No anthropometric measures were predictive of range of movement. Therefore, there is limited evidence to suggest that physical characteristics have a significant relationship to neck strength and range of movement in this population.

**Key Practice Points:**

- An association is evident between neck muscle strength, BMI and neck circumference.
- Inference of neck strength from these measures should be cautious.
- Neck range of movement is not influenced by anthropometric measures in this sample.
DOES THE USE OF SURGICAL MAGNIFICATION (LOUPES) EFFECT UPPER EXTREMITY PAIN, AND DISABILITY AMONG DENTAL HYGIENISTS

Hayes MJ, Osmotherly PG, Taylor JA, Smith DR, Ho A
School of Health Sciences, The University of Newcastle, Australia

Question: Does the use of loups reduce the level upper extremity pain and disability experienced by dental hygienists?

Design: Exploratory pre-test post-test study.

Participants: Twelve practicing dental hygienists experiencing musculoskeletal symptoms compared with 17 final year dental hygiene students.

Intervention: Individually fitted Galilean loups in 2.5x magnification used by the practicing hygienist group over 6-months.

Outcome Measures: Disability of the Arm, Shoulder and Hand questionnaire, shoulder range of motion, scapular position, grip strength and pinch strength analysed by 2x2 mixed ANOVAs.

Results: A significant interaction existed between time and treatment for the DASH scores (p < 0.04), indicating an improvement in symptoms for the treatment group but a reversed trend for the controls. Interactions between time and treatment type were not significant for any of the physical measures.

Conclusion: This is the first study to objectively assess the effect of surgical magnification on upper extremity pain and disability among practicing dental hygienists. Dental hygienists wearing loups exhibited a significant improvement in self-reported upper extremity MSD following the intervention. There were mixed findings in terms of the physical assessments, with improvements in hand strength and declines in shoulder position and range of motion.

Key Practice Points:
- Commonly available physiotherapy outcome measures can be used in occupational research
- Loupes may result in improvement self-reported upper extremity pain and dysfunction
- The effect of loups on MSD needs to be examined for periods longer than 6 months to determine the benefits of wear.

FATIGUE IN THE MINING INDUSTRY

Otto B
Thiess Pty Ltd

Questions: What is the frequency and severity of personal fatigue at a drive-in-drive-out (DIDO) project operated by a large open-cut coal contract organisation? What physical and mental health attributes and elements of work organisation are evident in workers who experience the highest levels of fatigue? What percentage of the mine’s DIDO workforce drive while fatigued? Is there a relationship between fatigue awareness and frequency and severity of fatigue?

Design: A cross-sectional customised survey.

Outcome Measures: Physical activity participation (short-form International Physical Activity Questionnaire), physical and mental health attributes (SF-36 Health Survey, Kessler Six Scale), sleep quality (Sleep Scale from the Medical Outcomes Study) and severity of fatigue (Samn-Perelli Fatigue Checklist).

Participants: Full-time male and female employees and equivalent contractors employed at a DIDO open-cut coal project in the Bowen Basin, Qld.

Intervention: A voluntary and confidential survey was administered to 438 workers.

Results: The results of this study are compared with current scientific knowledge and inform the development of fatigue management programs to target the identified needs of the organisation. Conclusion and implications for practice: The challenges for organisation and Health and Safety (H&S) professionals with managing fatigue in the mining industry are discussed. Ethics approval: Behavioural & Social Sciences Ethical Review Committee and Medical Research Ethics Committee of The University of Queensland – Number 2011000034.

Key Practice Points:
- There is no gold standard for identifying and assessing fatigue impairment in the workplace.
- To effectively manage fatigue, organisations should first understand the frequency and severity of fatigue in their workforce.
- Further evidence is needed in the role of behaviour change to reduce the risk of fatigue.

INTERPRETING A NORMAL RESPONSE TO ROTATION STRESS TESTING FOR THE ALAR LIGAMENTS

Osmotherly PG, Rivett DA, Rowe LJ

1School of Health Sciences, The University of Newcastle, Australia
2Division of Radiology, Hunter New England Area Health Service, Newcastle, Australia, School of Medicine and Public Health, The University of Newcastle, Australia

Question: Do published ranges of craniocervical rotation for the rotation stress test for the alar ligaments actually reflect ligament integrity?

Design: Within-participant experimental radiological study.

Participants: Sixteen people between the ages of 19 and 38 with no known neck problems.

Intervention: Participants were imaged in neutral and end-range rotation stress test positions using proton density-weighted sequences in a 3-Tesla MRI system.

Outcome Measures: Measurements made followed a standardised protocol relative to the position of the axis in axial section. The transverse foramina were aligned creating a reference plane. The position of the occiput in the head-neutral position was estimated by calculating the angle formed between a line joining the foramina lacerum and the reference plane. Measurements were repeated in the test position. Total rotation of the occiput was calculated as the difference between the angles between the neutral and test positions. The procedure was repeated and measurements recorded on four separate occasions. Reliability of measurements for each image was assessed by estimation of ICCs.

Results: Retest rotation of the occiput relative to a stabilised axis ranged between 1.7° and 21.5°. The mean range of rotation calculated was 10.6° (SD 5.1°). Reliability of measurements ranged from 0.75-0.96.

Conclusion: This is the first study to quantify rotation occurring during this test. The normal range of cranio cervical rotation tends toward lower published estimates. Caution should be exercised when presuming alar ligament integrity based upon larger published ranges.

Key Practice Points:
- There is considerable variation in the amount of cranio cervical rotation occurring during the imposition of this stress test.
- The range of cranio cervical rotation during rotation stress testing should typically be 21° or less.
- It should not be inferred that all findings less than 21° represent normal ligament integrity.

MYOFASCIAL INJURY AS A DIFFERENTIAL DIAGNOSIS TO MUSCLE STRAIN: IMPLICATIONS TO MANAGEMENT AND REHABILITATION

Pacecca EM
Western Force, Perth

Questions: Are myofascial strains currently classified as a differential diagnosis to muscle strain? Is imaging of soft tissues injuries indicated to assist with differential diagnosis? Is there a prognostic value in the differential diagnosis of muscle strains with fibre disruption and myofascial injuries with no muscle fibre disruption?

Design: Case study.

Participant: One professional rugby player who sustained an acute calf injury whilst training.

Outcome Measures: Number of days to: walk pain free, perform pain free unilateral calf raise, return to training, return to playing.

Results: The player was diagnosed using Magnetic Resonance Imaging (MRI) as having sustained a myofascial injury without complete muscle fibre separation. Time to return to pain free walking (2 days), pain free unilateral calf raise (4 days) and training (8 days) were all substantially quicker than an expected grade II calf muscle strain.

Conclusion: There is an argument that imaging of acute calf injuries should be performed to provide a greater prognostic indication of return to function.
Key Practice Points:
- MRI can discriminate between myofascial injury and muscle strains with fibre disruption.
- Isolated myofascial injuries have the ability to return to sport substantially quicker than muscle strains.
- This case study illustrates the importance of differentiating between myofascial injuries and muscle strains with fibre disruption.

 MANAGEMENT OF A SCAPHOID FRACTURE BY PERCUTANEOUS SCREW FIXATION: CASE STUDY OF AN ELITE ROAD CYCLIST

Pacey EM
Weston Force, Perth

Questions: Does percutaneous screw fixation reduce the rehabilitation time of a scaphoid fracture in an elite male road cyclist?

Design: Case study.

Participant: One professional male road cyclist who sustained a scaphoid fracture whilst racing.

Outcome Measures: Grip strength and wrist range of motion (flexion, extension, radial deviation, ulnar deviation, supination and pronation).

Results: The athlete was able to return to racing at twenty eight days post injury with full range of motion of the wrist and displayed a 17% loss of grip strength compared to the contralateral side.

Conclusion: Percutaneous screw fixation allows early mobilisation, strengthening and culminates in a reduction in time missed from a scaphoid fracture.

Key Practice Points:
- Percutaneous screw fixation is effective in the management of scaphoid fracture by allowing early mobilisation and strengthening exercises.
- An elite male cyclist with scaphoid fracture was able to return to sport twenty eight days post scaphoid fracture after percutaneous screw fixation.

A RANDOMISED CONTROLLED TRIAL OF TWO EXERCISE PROGRAMMES FOR CHILDREN WITH JOINT HYPERMOBILITY SYNDROME AND KNEE PAIN

Pacey V1,2, Tofts L1,2, Adams R2, Munns C1,2 & Nicholson L1,2
1 The Children’s Hospital at Westmead, Westmead
2 The University of Sydney, Sydney

Question: Does a physiotherapist prescribed exercise programme effectively reduce knee pain in children with Joint Hypermobility Syndrome (JHS), and does the range in which these exercises are performed affect outcomes?

Design: Prospective parallel-group randomised controlled trial with concealed allocation, assessor and patient blinding and intention-to-treat analysis.

Participants: Ninety-one children aged 6-16 years with Joint Hypermobility Syndrome.

Intervention: Following a minimum 2 week baseline period of no treatment, children undertook an 8 week exercise programme performed to either full knee hyperextension or limited to neutral knee extension.

Outcome Measures: The primary outcome was knee pain. Secondary outcomes were quality of life, thigh muscle strength, and function. Measures were taken at initial assessment, following the baseline period and post treatment.

Results: Regardless of group allocation, child-reported maximal knee pain decreased (mean 14.5/100, 95% CI 5.2 to 23.6, p<0.003). Based on parent-report the child’s overall psychosocial health (p=0.009), specifically self-esteem (p=0.034), mental health (p=0.001) and behaviour (p=0.02), improved in favour of exercises performed to full hyperextension. Conversely, the child’s overall physical health significantly favoured exercising only to neutral (p=0.037). No other differences were found between groups and no adverse events occurred.

Conclusion: A physiotherapist prescribed, supervised, individualised and progressed exercise programme is significantly more effective than no treatment in reducing knee pain in children with JHS. When performed into full hyperextension these exercises were significantly more effective at improving psychosocial health, while physical health benefitted from limiting exercises to neutral knee extension.

Trial registration: ACTRN12606000109505

Key Practice Points:
- Eight weeks of physiotherapist prescribed exercise effectively reduces knee pain in children with JHS.
- Exercises should be pain-free, partially supervised, individualised, and progressed based on the child’s competence.
- Exercises performed into hypermobile range have positive psychosocial benefits where as those performed only to neutral have greater physical benefits.

THE FATIGUE EXPERIENCE OF CHILDREN WITH JOINT HYPERMOBILITY SYNDROME: A PARENT AND CHILD’S PERSPECTIVE

Pacey V1,2, Tofts L1,2, Adams R2, Munns C1,2 & Nicholson L1,2
1 The Children’s Hospital at Westmead, Westmead
2 The University of Sydney, Sydney

Questions: Do children with Joint Hypermobility Syndrome experience disabling fatigue? Do children and parents report similar levels of fatigue? Is the level of fatigue experienced comparable to that of children with other chronic conditions?

Design: Cross-sectional study.

Participants: Ninety-one children aged 6-16 years with Joint Hypermobility Syndrome.

Outcome Measures: Fatigue was measured using the Peds QL Multidimensional Fatigue scale, an 18-item questionnaire completed separately by the child and their primary caregiver. Three domains are included – cognitive, sleep/rest and general fatigue.

Results: Child-reported and parent-reported total fatigue was significantly lower than published normative data (p<0.001). Child and parent-reported individual domain and overall fatigue scores were highly and significantly correlated (r=0.53 – 0.77, p<0.001), however parents reported the children experienced significantly greater general fatigue (p<0.001). Children with Joint Hypermobility Syndrome reported experiencing worse fatigue than children with cancer, juvenile idiopathic arthritis and juvenile dermatomyositis (p<0.001), however similar fatigue levels to that of children with chronic pain conditions (p=0.24) and fibromyalgia (p=0.36).

Conclusion: This is the first study to quantify child and parent perceptions of the extent of fatigue experienced by children with Joint Hypermobility Syndrome. The fatigue experienced by these children is similar to that of children with known pain conditions and worse than those with other chronic conditions.

Key Practice Points:
- Children with Joint Hypermobility Syndrome experience disabling fatigue.
- Children and their parents provide concordant reports of the extent of fatigue experienced by the child.
- The impact of fatigue should be measured and considered by physiotherapists when treating children with Joint Hypermobility Syndrome.
A COMPARISON OF A SERVICE MODEL FOR OSTEOARTHRITIS OF THE HIP AND KNEE

Page C1, Lim K1,2, Hall J1
1 St Vincent’s Hospital Melbourne
2 Western Hospital, Melbourne

Questions: The osteoarthritis hip knee service (OAHKS) was a Victorian Government initiative to improve management of patients with arthritis and access to surgery. Has the model reduced the number of patients requiring orthopaedic assessments? Are patients triaged to the surgeon appropriate for surgery? How does the OAHKS model compare between service providers? Can a physiotherapist in an advanced scope role provide similar outcomes when compared to rheumatologists?

Design: Retrospective observational study.

Participants: All patients that attended the OAHKS at St Vincent’s (SV) and Western Hospital (WH) over a two year period. Patients were seen by a physiotherapist at WH and either a physiotherapist or rheumatologist at SV.

Outcome Measures: The numbers of patients seen in clinic, those referred to orthopaedic specialists and the conversion rate to joint arthroplasty surgery. The data from the physiotherapist and rheumatologist at SV was compared.

Results: At SVOAHKS 590 patients were seen (206 by physiotherapist and 384 by rheumatologist), Overall 125 (21%) were referred to orthopaedics and 102 (16.6%) went on the have joint arthroplasty. Of the patients seen by the physiotherapist 49 (23%) were sent to orthopaedics and B4% of these referrals resulted in joint arthroplasty. At WH 156 (45%) patients were referred to orthopaedics and 78 (50%) were waitlisted for joint arthroplasty.

Conclusion: The OAHKS model is likely to reduce the rate of inappropriate referrals seen by orthopaedic surgeons. Physiotherapists working directly with a rheumatologist may further enhance referral selection to surgeon through better access to education, development of protocols and treatment options for patients.

Key Practice Points:
• An osteoarthritis of the hip and knee service can improve patient flow in hospital outpatient by appropriately triaging patients requiring joint arthroplasty to surgeons.
• Physiotherapists working in advanced scope roles can be part of an effective work force redesign
• An advanced scope physiotherapist working directly alongside a rheumatologist may provide further opportunities for improved patient care.

EARLY EXERCISE IN PATIENTS WITH SEPSIS SYNDROMES IMPROVES TISSUE OXYGENATION

Kayambu G1,2, Boots RJ1,2, Paratz JD1,2
1 Burns, Trauma & Critical Care Research Centre, The University of Queensland, Brisbane
2 Royal Brisbane & Women’s Hospital, Brisbane
3 National University Hospital, Singapore

Question: Is early exercise in critically ill patients with sepsis syndromes beneficial and safe with regards to tissue oxygenation and microcirculation?

Design: A within participant pre-post design

Participants: Sixteen critically ill patients with septic shock and mechanically ventilated in the first 24 hours of diagnosis

Intervention: Patients were given 30-60 mins of electrical muscle stimulation and passive movements to major muscle groups.

Outcome Measures: Changes in tissue oxygenation were assessed at baseline and immediately post exercise using a near infrared oxygenation device on the thenar eminence to the assess percentage of oxygen in the muscle (StO2) and percentage of muscle oxygen extraction rate (MOER%) under both baseline and hyperaemic conditions. 3 an orthogonal polarization spectral imaging device was placed sublingually to measure the microvascular flow index and capillary density of the microcirculation.

Results: All 16 patients completed the trial. There were significant effects post exercise on StO2, with hyperaemia (63.0 (±3.3)% to 65.0 (±5.3)%, p = 0.02), and a trend towards an improvement in capillary density (2.46 (±1.04)% to 3.70 (±1.04)%), p = 0.08). There were no significant effects on percentage of muscle oxygen extraction rate or microvascular flow index.

Conclusion: Early exercise appears to have a beneficial effect on critically ill patients as tissue oxygenation improved. There were no adverse effects.

Trial registration: ACTRN12611000550909

Key Practice Points:
• The microcirculation is often impaired in early severe sepsis and is associated with a poor prognosis
• Early exercise in critically ill patients with sepsis syndromes is controversial
• This demonstrates that early exercise in patients with severe sepsis is beneficial as it recruits the microcirculation and increases tissue oxygenation

POSTURAL ACTIVITY OF THE PSOAS MAJOR AND QUADRATUS LUMBORUM MUSCLES DIFFERS BETWEEN MUSCLE REGIONS BASED ON THE MECHANICAL ADVANTAGE

Park RJ1,2, Tsao H1, Cresswell AG1,2, Hodges PW1
1 The University of Queensland, NHMRC Centre of Clinical Research Excellence in Spinal Pain, Injury and Health, School of Health and Rehabilitation Sciences, Brisbane
2 The University of Queensland, School of Human Movement Studies, Brisbane

Question: Are discrete regions of the psoas major and quadratus lumborum muscles activated differentially in a postural task based on their mechanical advantage based on unique anatomy?

Design: Cross sectional study.

Participants: Thirteen healthy volunteers (9 male).

Intervention: Participants performed rapid arm movements that induced postural perturbation. Fine-wire electrodes were inserted with ultrasound guidance into fascicles of psoas major arising from the transverse process and vertebral body, and into the anterior and posterior layers of quadratus lumborum on the right side.

Outcome Measures: Onset of myoelectric activity and activation pattern of the psoas major and quadratus lumborum muscles.

Results: Onsets of both regions of psoas major were earlier during bilateral arm flexion than extension (all: p < 0.05). Further inspection of the individual data showed two distinct activation patterns in each region of psoas major particularly during bilateral arm flexion. Onset of anterior layer of quadratus lumborum was earlier during bilateral arm extension than flexion (p < 0.05), whereas onset of the posterior layer did not differ between directions of bilateral arm movements (p > 0.14).

Conclusion: The findings of this study indicate that the central nervous system coordinates activity of specific regions of psoas major and quadratus lumborum independently as a component of the anticipatory postural adjustments that precedes the predictable challenge to the spine associated with limb movements. The spatial and temporal features of discrete activity of different regions within psoas major and quadratus lumborum muscles matched their differing mechanical advantage predicted from their anatomy.

Key Practice Points:
• The central nervous system differentially activates individual regions within the psoas major and quadratus lumborum muscles to control sagittal plane perturbations on the spine
• Sophisticated independent control of activation of the psoas major and quadratus lumborum muscles is based on mechanical advantage
• Training of these muscles may require consideration of the unique activation of different muscle regions
FUNCTIONAL ELECTRICAL STIMULATION-ASSISTED CYCLING IN THE CRITICALLY ILL: A PILOT CASE-MATCHED CONTROL STUDY OF SAFETY, FEASIBILITY AND EFFECTIVENESS

Parry S1, Berney S1, Warrillow S1, El-Ansary D1, Bryant A1, Koopman R1, Hart N1, Puthucheary Z1
1Department of Physiotherapy, School of Health Sciences, The University of Melbourne, Melbourne
2Department of Physiotherapy, Austin Health, Melbourne
3Department of Intensive Care, Austin Health, Melbourne
4Department of Physiology, The University of Melbourne
5Guy’s and St Thomas’ NHS Foundation Trust and King’s College London, NIHR Comprehensive Biomedical Research Centre, London, UK
6Department of Asthma, Allergy and Lung Biology, Institute of Health and Human Performance, University College London, Kings College London, UK

Question: Is functional electrical stimulation-assisted cycling safe and feasible in septic patients in intensive care? What are the trends for effectiveness?

Design: Interventional cohort study with case-match-controlled groups.

Participants: Sixteen adult intensive care unit patients with sepsis mechanically ventilated for 48 hours and in intensive care for at least four days.

Interventions: Eight subjects underwent functional electrical stimulation-assisted cycling for at least 20 minutes, five times a week until intensive care discharge. Eight individuals were case-matched from a similar time period.

Outcome Measures: Safety and feasibility were examined using a priori defined endpoints. The effectiveness of intervention on functional recovery was examined by comparing differences in mean scores between groups for physical function intensive care ordinal scales on awakening and time to reach functional milestones. Incidence and duration of delirium were also measured.

Results: This study involved 16 moderately unwell individuals. There were no major adverse events. Eighty percent of the time a trend towards statistical significance (p=0.06) was observed. There was a trend towards statistical significance (p=0.06) and a clinically significant difference (mean difference 3.87) in favor of the intervention group for awakening incidence (control: 7.62 days versus 1.25 days; p=0.044).

Conclusion: The intervention was safe and feasible. Preliminary findings suggest that it may facilitate earlier and higher levels of functional recovery.

Key Practice Points:
- Functional electrical stimulation-assisted cycling was safe and feasible in individuals with sepsis.
- Functional electrical stimulation-assisted cycling may facilitate earlier and faster recovery of functional milestones; further research is required to confirm the preliminary findings.
- Incidence and duration of delirium was higher in individuals who did not undergo the early intervention.

A NEW TWO-TIER APPROACH FOR MEASUREMENT OF STRENGTH IN CRITICALLY ILL PATIENTS

Parry S1, Berney S1, Murphy L1, El-Ansary D1, Granger C1, Koopman R1, Dunlop D1, Denely L1
1Department of Physiotherapy, School of Health Sciences, The University of Melbourne, Melbourne
2Department of Physiotherapy, Austin Health, Melbourne
3Department of Physiology, The University of Melbourne, Melbourne

Question: Is there significant difference between isometric and through-range assessment of muscle strength in critically ill patients using Medical Research Council sum-score? Is the four-point collapsed scoring system more reliable than the six-point system? What is the cutoff value for identification of intensive care acquired weakness using the four-point scale?

Design: Prospective observational cohort study.

Participants: Adult intensive care intubated for more than 48 hours. Procedure: Testing occurred over a 24-hour period with patients assessed four times by two therapists.

Outcome Measures: Manual muscle testing using Medical Research Council sum-scoring system according to both (i) six-point (ii) four-point scoring systems; and (iii) isometric and (iv) through-range techniques. Handgrip strength using JAMAR dynamometry.

Results: Twenty-nine patients were included. Inter-rater reliability was high comparing the same technique and scoring systems. The tightest reliability and exact agreement was seen for four-point isometric testing. Differences existed between isometric and through-range scores (mean difference 1.76; p=0.005) only for the six-point scoring system. Using the new 4-point scale (isometric technique) a cutoff score of 26 out of 36 was identified. The sensitivity (50.9%) and specificity (76.5%) of handgrip as a surrogate measure for identifying weakness was high.

Conclusion: Isometric and through-range techniques are not comparable, with greatest agreement observed with the isometric technique. A two-tier process is recommended for identifying weakness in the critically ill: screening using handgrip strength with follow-up muscle strength assessment using isometric four-point scoring system if they fail below handgrip cutoff scores.

Key Practice Points:
- Recommend new two-tier assessment for identification of intensive care acquired weakness - (1) handgrip strength and (2) Medical Research Council sum-score testing.
- Handgrip strength using dynamometry is valid and highly sensitive. The cutoff scores for identification of intensive care acquired weakness is <11 kg (male) and <7 kg (female).

EVIDENCE OF EFFICACY OF LEG MUSCLE POWER TRAINING IN PARKINSON’S DISEASE: A RANDOMISED CONTROLLED TRIAL

Paul SS1, Canning CG1, Sherrington C2, Song J3, Fung VSC4
1Faculty of Health Sciences, The University of Sydney, Sydney, Australia
2The George Institute for Global Health, Sydney, Australia
3Department of Neurology, Westmead Hospital, Sydney, Australia
4Sydney Medical School, The University of Sydney, Sydney, Australia

Question: What is the effect of muscle power training on power, strength, mobility and balance in people with Parkinson’s disease?

Design: Randomised controlled trial with concealed allocation, assessor blinding and intention-to-treat analysis.

Participants: 40 individuals with Parkinson’s disease.

Intervention: The experimental group completed a 12-week high velocity leg muscle power training program using pneumatic variable resistance equipment. The control group completed a 12-week sham home program comprising low intensity exercises.

Outcome Measures: Primary outcomes were peak power of four leg muscle groups. Secondary outcomes were leg muscle strength, mobility (Timed Up & Go) and balance (choice stepping reaction time and maximal balance range). Measures were taken before and after training.

Results: After 12-weeks’ training, the experimental group had significantly increased power in the leg extensors (57.9 watts, 95% CI 22.0 to 93.7), knee flexors (29.6 watts, 95% CI 7.4 to 51.8), hip flexors (28.8 watts, 95% CI 19.6 to 38.5), hip abductors (37.4 watts, 95% CI 19.9 to 54.9) compared with the control group. The experimental group also significantly increased leg muscle strength (p < 0.001 to 0.07) and showed trends towards better performance in Timed Up & Go, choice stepping reaction time and maximal balance range (p = 0.11 to 0.21).

Conclusion: A short duration muscle power training program significantly improved power in all trained muscle groups in people with Parkinson’s disease. Power training may also improve mobility and balance. Further studies examining the effect of power training on fall risk in community settings are warranted.
THE INFLUENCE OF NECK POSTURE WHEN LIFTING

Peolsson A1,2, Marstein E1, McNamara T1, Nolan D1, Sjaaberg E, Peolsson M1, Jull G1, O’Leary S1,4

1NHMRC CCRE (Spinal Pain, Injury and Health), The University of Queensland, Brisbane
2Department of Medical and Health Sciences, Division of Physiotherapy, Faculty of Health Sciences, Linköping University, Linköping, Sweden
3Computational Life Science Cluster and Department of Chemistry, Umeå University, Umeå, Sweden
4Physiotherapy Department, Royal Brisbane and Women’s Hospital, Queensland Health, Brisbane

Question: Does posture of the neck influence the activity of the multilayered dorsal neck muscles during a lifting task?

Design: Within-participant experimental study.

Participants: Twenty one healthy subjects (seven males and fourteen females, mean age 26 years (SD 6.5)).

Outcome Measures: Ultrasound measurements of dorsal neck muscle deformation (mechanical measure of muscle activity) were compared over two time points (rest, during lift) during a lifting task performed in three different neck postural conditions (neutral, 30° flexed and forward head posture). Ultrasound videos recorded during the task were analyzed by post-process speckle tracking analysis to evaluate the deformation values in root mean square.

Results: Significantly greater muscle deformation was induced by flexed and forward head postures, compared to the neutral posture, for all dorsal neck muscles at rest (p < 0.05). Significant condition by time interactions associated with the lift were observed for four out of the five dorsal muscles (p < 0.02). These findings demonstrate that posture of the cervical spine influenced the level of muscle deformation not only at rest, but also when lifting.

Conclusion: The findings of the study suggest that neck posture should be considered during the evaluation or design of lifting activities as it may contribute to excessive demands on dorsal neck muscles with potential detrimental consequences.

Key Practice Points:
- Neck postures influence the level of muscle activity during a lift
- Flexed or forward head postures are associated with a heightened level of activity compared to neutral neck postures
- Posture of the neck needs to be a consideration when evaluating activities that involve lifting

CERVICAL MOVEMENT SENSE: NORMATIVE DATA FOR A CLINICAL TOOL

MPhty PM, MPhty BC, MPhty KG, MPhty WV, Treleaven J

Division of Physiotherapy, CCRE - Spine, School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane

Question: Can a simple clinical tool to assess cervical movement sense (CMS) be done without the need for advanced equipment and if so what is normative data for time, frequency of error and magnitude of error for different patterns, speed and directions of the test?

Design: Prospective observational study.

Intervention: Forty-three healthy control subjects were fitted with a laser on the head and asked to trace two randomised patterns to left and right, as accurately and as fast, and as accurately as they could, by moving the laser with head movement. Two methods of assessment, real time and video analysis, were compared for inter-test reliability, and inter-rater reliability (n=10) of the video analysis was performed.

Outcome Measures: Differences between time taken to complete the test, frequency of error, magnitude of error for pattern, direction and speed were compared within subjects.

Results: The results demonstrated that the two assessment methods had high inter-test and the video method had high inter-rater reliability. Subjects made more errors when tracing the figure eight compared to the zigzag pattern and when instructed to perform the tasks faster. There was no learning effect or differences when performing the tasks to the left or right.

Conclusion: Normative ranges for frequency of error and timing for task completion are proposed. Assessment of CMS is feasible in a clinical setting. Future research is needed to determine age and gender specific normative and pathological ranges. This suggested protocol should also be tested for validity against a known gold standard method.

Key Practice Points:
- Simple measurement of CMS is feasible for clinicians.
- In healthy individuals, direction does not affect performance, accuracy with the task seems more appropriate and different patterns pose varying levels of difficulty.
- Presented normative data for time and frequency of error could guide clinicians when assessing CMS in neck pain patients.

QUADRICEPS MUSCLE FORCE CONTROL IS RELATED TO KNEE FUNCTION 12 MONTHS AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

Perraton LG1,2, Teilanidis S1, Clark RA2, Pua YH3, Crossley KM4, Bryant AL1

1University of Melbourne
2Australian Catholic University, Melbourne
3Singapore General Hospital, Singapore
4University of Queensland

Questions: Do impairments in the accuracy of quadriceps force output exist after anterior cruciate ligament reconstruction (ACLR)? Is there a relationship between clinically-determined knee function and quadriceps muscle force control?

Design: Cross-sectional observational study.

Participants: Thirty patients (19 males) 12-24 months post ACLR with a semitendinosus-gracilis graft and 30 physically-active control participants (15 males).

Outcome Measures: Participants performed a sub-maximal isometric knee extension task on an isokinetic dynamometer. The task involved matching a target torque displayed on a computer monitor that varied between 5-30% of their previously-determined maximum voluntary contraction (MVC) at a speed of 0.25Hz for one minute (7.5 cycles). Root mean square error of the torque output was used to assess the accuracy of quadriceps force. Activation strategies of the hamstrings and quadriceps were quantified with electromyography. In the ACLR group, two sub-groups were created (high-error and low error) based on the median value of quadriceps error to compare self-reported knee function, using the Cincinnati Knee Rating Scale (CKRS).

Results: ACLR participants demonstrated higher quadriceps force error (p=0.03) and greater activation of medial hamstrings (p=0.001) and vastus medialis (p=0.04) than control participants. In the ACLR group, significant negative correlations were found between quadriceps force error and medial hamstring activation (r = -0.40) and greater hamstring activation (r = -0.45) and lateral hamstring activation (r = -0.40). ACLR participants with higher error had significantly better knee function [CKRS= 90.6%, 95% CI=86.5-94.7] than participants with lower error [CKRS= 81.2%, 95% CI=73.0-89.4].

Conclusion: Greater hamstring co-contraction and lower quadriceps error were associated with worse knee function and are thought to reflect mal-adaptive neuromuscular strategies.

Key Practice Points:
- Optimizing neuromuscular control is a key goal of Physiotherapy after ACLR
- Little is known about the relationship between clinically-determined function and neuromuscular control after ACLR
- Quadriceps muscle force control and hamstring co-contraction may be important considerations after ACLR from a functional perspective
PELVIC TILT DIFFERENCES IN SITTING AND STANDING IN TOTAL HIP REPLACEMENT PATIENTS: IMPLICATIONS FOR PHYSIOTHERAPISTS

Perriman D1,2, Au J1, Smith P1,2
1Trauma And Orthopaedic Research Unit, Canberra Hospital
2ANU College of Biology, Medicine and Environment

Question: Is pelvic tilt different in supine X-rays compared to standing X-rays in Total Hip Replacement (THR) patients? Do intra-subject differences in pelvic tilt affect the risk of dislocation in these patients?

Design: Prospective observational study.

Participants: Thirty (18 F) adults 6 weeks post total hip replacement surgery who received a standardized antero-posterior and lateral X-ray set.

Outcome Measures: All the angles were measured from lateral digital x-ray images using AutoCAD software. Pelvic tilt and acetabular anteversion angles were referenced from the anterior pelvic plane. A paired t-test was used to assess the differences in pelvic tilt and acetabular anteversion in supine and standing. McNemar’s test was used to determine whether patients were significantly more likely to be in the ‘safe zone’ for dislocation risk in supine than in standing. Differences were considered significant if p < 0.05.

Results: The pelvis was significantly posteriorly tilted in standing compared to supine (2.2° ± 1.39° in supine and -6.8° ± 1.67° in standing; p < 0.0001). Acetabular anteversion was significantly greater in standing compared to supine (p < 0.0001). The mean acetabular anteversion was 19.4° ± 1.18° in supine and 29.6° ± 1.42° in standing.

Patients were significantly more likely to be outside the ‘safe zone’ for dislocation risk in standing than they were in supine (p < 0.0001).

Conclusion: Pelvic tilt position is a significant factor affecting dislocation risk in patients with THR. Postural awareness training with respect to pelvic tilt should arguably be part of hip replacement rehabilitation programmes.

A SYSTEMATIC VIDEO ANALYSIS OF HAMSTRING INJURIES IN AUSTRALIAN RULES FOOTBALL – A PILOT STUDY

Vetrival V1, Serpell B1,2, Perriman D1,2, Smith P1,2
1Trauma And Orthopaedic Research Unit
2Australian National University Medical School

Question: Can systematic video analysis be used to identify the mechanisms which contribute to hamstring injury in AFL players?

Design: Retrospective observational study.

Participants: Thirteen videos of hamstring injury being sustained were systematically analysed by 3 independent observers.

Outcome Measures: Player speed and speed change and interactions with other players and the ball were assessed within 5 seconds prior to the point of injury. Biomechanical data and player activity were classified according to a pre-defined system and emerging patterns and trends were identified.

Results: Twelve videos were included in the final analysis. There was no significant correlation between injury incidence and game quarter. The majority of injuries occurred to players while sprinting in non-contact situation. Four main categories of manoeuvres were identified as contributing to injury. In 10 cases the player was weight bearing through the injured leg at the point of injury. Players’ body positions were often found to be mechanically disadvantageous, placing increased strain on the hamstrings.

Conclusion: Systematic video analysis of hamstring injury can provide useful information for both coaches and physiotherapists. Four common manoeuvres likely to be implicated in hamstring strain were revealed. Based on the results we speculate that the pennate nature of the hamstring muscles may contribute to the injury mechanism.

THE EFFECT OF THREE DIFFERENT EXERCISE REGIMES ON NECK MUSCLE ENDURANCE FOR CHRONIC WHIPLASH ASSOCIATED DISORDERS. A RANDOMISED CONTROL TRIAL

Peterson G1,2, Landén Ludvigsson M1,2, O’Leary S3,4, Dederig A1,2, Pedisson A1,2
1Centre for Clinical Research Särmland, Uppsala University, Sweden
2Department of Medical and Health Sciences, Division of Physiotherapy, Faculty of Health Sciences, Linköping University, Linköping, Sweden
3Rehab Väst, County Council of Östergötland, Sweden
4NHMRC CCRE (Spinal Pain, Injury and Health), The University of Queensland, Brisbane, Australia
5Physiotherapy Department, Royal Brisbane and Women’s Hospital, Queensland Health, Brisbane, Australia
6Sweden Department of Neurobiology, Care Sciences and Society, Division of Physiotherapy, Karolinska Institutet and Department of Physical Therapy, Karolinska University Hospital, Sweden

The study protocol was approved by the regional ethical review board in Linköping, Sweden and performed in accordance with the Declaration of Helsinki.

Question: Does combining exercise with a behavioral intervention result in superior gains in tolerance (holding capacity and pain) to extensor endurance tests in people with chronic whiplash injury?

Design: A multicenter, prospective, randomized controlled study.

Participants: Two hundred and sixteen individuals (mean age 40 years (SD, 11.4)) with persistent symptoms following a whiplash injury participated in the study.

Interventions: Two groups performed specific endurance training of their neck muscles over a 12 week period (Group 1 neck exercise only, Group 2 combined neck exercise and behavioral intervention) and one group were prescribed general physical activity (Group 3).

Outcome Measures: Tolerance to endurance tests of the cervical extension (prone against load) was compared at baseline, and at three and six month follow-up. Performance was recorded as maximal holding time (seconds) and perceived pain intensity (visual analogue scale) during the test.

Results: Holding capacity of cervical extension improved significantly (p < 0.01) at 3 months for Group 2 compared with Group 3. Holding capacity improved significantly for men only. Pain intensity after the endurance test decreased for both genders at three months for group 1 only, and for both Groups 1 and 2 at 6 months, compared with Group 3. Holding capacity improved significantly for men only. Pain intensity after the endurance test decreased for both genders at three months for group 1 only, and for both Groups 1 and 2 at 6 months (p = 0.05) compared to group 3.

Conclusion: Combining a behavioral approach with specific exercise appears to result in a more rapid improvement in holding capacity during endurance tests in chronic whiplash but findings are not consistent between genders.

Key Practice Points:
- The addition of a behavioral intervention to exercise may result in a more rapid improvement in performance during cervical endurance tests.
- There appears to be differences in response to the exercises between genders.
- Group 1 exercises decreased pain more rapidly and can be more preferable for some patients.
WHAT SHOULD BE REPORTED WHEN DESCRIBING EDUCATIONAL PROCESSES TO TEACH EBP: A DELPHI SURVEY

Phillips AC1, Lewis LK1, McEvoy MP2, Glasziou P3, Moher D3, Galipeau J1, Tilson JK2, Hammick M4, Williams MT1

1Division of Health Sciences, University of South Australia, Adelaide
2Centre for Research in Evidence-Based Practice (CREBP), Band University, Queensland
3Clinical Epidemiology Program, Ottawa Hospital Research Institute, Ottawa, Canada
4Ottawa Research Institute, Centre for Practice-Changing Research (CPCR), Ottawa, Canada
5University of Southern California, Division of Biokinesiology and Physical Therapy, Los Angeles, USA
6Bournemouth University, Bournemouth, UK

Question: What information should be reported in studies of educational interventions targeting foundation knowledge and skills in evidence-based practice?

Design: An online Delphi survey (four rounds) was conducted from October 2012 to March 2013.

Participants: An international expert panel of 36 researchers, journal editors and educators participated.

Intervention: Four rounds of anonymous surveys and responses were completed. Round 1 used an open-ended question to generate a list of items. In rounds 2 and 3 participants rated all items using an 11-point Likert scale and volunteered any additional items. Feedback from each round was provided to participants.

Outcome Measures: Consensus agreement was defined a priori as ≥ 80% agreement within four categories of importance: low (0-4), moderate (5-6), high (7-8) and very high (9-10). Results: Round 1 generated 344 items, representing 68 unique items for rating in round 2. A further eight items were added from rounds 2 and 3. Rates rates with, with 27 (79%) participants completing all four rounds. Consensus agreement was achieved for a total of eight items (11%) intervention aims, learning objectives, evaluation method used, evidence intervention yielded intended outcomes, research design, results, aims / research question and discussion). When the rating categories were collapsed into low to moderate (0-6) and high to very high (≥ 7), consensus agreement was achieved for 38 items (50%).

Conclusion: The findings from this Delphi survey provide a foundation for the development of a reporting guideline for evidence-based practice education interventions. Ethics: Ethical approval was obtained from the University of South Australia Human Research Ethics Committee (protocol no. 25590).

Key Practice Points:
- It is unclear which items are important when describing an evidence based practice (EBP) educational intervention.
- Development of minimum requirements for reporting EBP educational interventions would enable greater consistency and transparency.
- This Delphi survey completes the second step in the development of a reporting guideline for EBP educational interventions.

PREDICTING THE OUTCOME OF PATIENT SPECIFIC EXERCISE INTERVENTIONS: DO WE NEED CONSCIOUS INPUT TO MAKE MOTOR CONTROL CHANGES?

Phillips C

DMA Clinical Pilates & Physiotherapy, Melbourne

Introduction / background: Recent studies into motor control strategies imply that implicit training of task control is more effective than conscious explicit training of muscles or tasks. This has been supported clinically by published research into Clinical Pilates training where recordable changes in a validated dynamic stability control task show improvement in motor performance beyond conscious control. The intervention is based on a matched/subgrouping training process. Degradation of motor performance also occurs predictably with an unmatched intervention.

Purpose/objectives: That such predictable changes are possible in a clinical situation raises the question, “are we focussing on the brain and the complexities of conscious control too much when the control centre is elsewhere and more basic?”. Motor control training in the presence of pathology quite simple but being made too complex & unwieldy. Research needs to help clinicians make daily decisions not just generate more research.

ISSUES/QUESTIONS FOR INVESTIGATION OR IDEAS FOR DISCUSSION:
What is the mechanical process affecting neural activity with directional exercise and what improves the latency of neural activity? As we are seeing the same process occur in general, neurological & sporting populations the suggestion is that intraneural conductivity at the local level is affected. Is this a simple spinal reflex model. Using simple movement assessment tools it would appear a valid, predictable subgrouping process is possible, and the hypothesis that a “functional” approach may supercede the reductionist individual muscle approach to stability training.

IN PATIENTS WITH ANKYLOSING SPONDYLITIS DOES AQUATIC PHYSIOTHERAPY MAKE A DIFFERENCE TO PAIN, STIFFNESS AND FATTIAGE?

Philpotts W

Wesley Mission Brisbane

Question: In patients with Ankylosing Spondylitis does aquatic physiotherapy in addition to usual pharmacological treatment make a difference to pain, stiffness and fatigue?

Design: A systematic search of published literature from 1982-2012.

Participants: Ankylosing Spondylitis patients from clinics in Europe aged 17-69.

Intervention: All studies examined included a component of aquatic physiotherapy which was defined as therapeutic exercise in the water.

Outcome Measures: Papers were appraised for research merit using the PEDro scale, summarised in table form for comparison, and examined for the reported positive effect of hydrotherapy on the outcomes of pain stiffness and fatigue.

Results: Four systematic reviews and four randomised control trials were included. There were three papers of moderate quality that indicated benefit in the domains of pain and stiffness from aquatic physiotherapy included as a component of a comprehensive exercise program. No conclusive positive evidence was found for the domain of fatigue. No studies examined aquatic physiotherapy as a stand-alone treatment modality.

Conclusion: There is insufficient evidence to support or refute the efficacy of aquatic physiotherapy as providing additional benefit to pharmacological treatment among Ankylosing Spondylitis clients. Future research needs to examine aquatic physiotherapy as a stand-alone modality. The domains of pain, stiffness and fatigue should be examined as single domains.

Key Practice Points:
- The literature indicates that aquatic physiotherapy as included in a more comprehensive program is beneficial for the domains of pain and stiffness, and possibly fatigue.
- Aquatic physiotherapy should be included as part of the comprehensive management of AS.

EFFECTICITY OF EPIDURAL INJECTIONS IN THE MANAGEMENT OF SCIATICA: A SYSTEMATIC REVIEW WITH META-ANALYSIS

Pinto RZ1, Maher C1, Ferreira M1, Hancock M2, Oliveira D1, McLachlan A3, Koes B1, Ferreira P1

1The George Institute for Global Health; Sydney Medical School, University of Sydney, Sydney, Australia
2Faculty of Human Sciences, Macquarie University
3Discipline of Physiotherapy, Faculty of Health Sciences, University of Sydney
4Centre for Education and Research on Ageing, and Concord Hospital, Sydney, Australia
5Erasmus Medical Centre, Rotterdam, the Netherlands

Question: Is epidural corticosteroid injections effective in managing patients with sciatica?

Design: Systematic review with meta-analysis of placebo-controlled randomised trials.

Participants: To be eligible, clinical trials had to include only patients with sciatica (that is, pain radiating below the knee) or a synonym for sciatica (e.g., radiculopathy, disc herniation, radiculitis and nerve root pain).
DO LEVELS OF LEISURE TIME PHYSICAL ACTIVITY PREDICT CLINICAL OUTCOMES IN PEOPLE SEEKING CARE FOR CHRONIC AND PERSISTENT LOW BACK PAIN?

Pinto RZ1, Ferreira P2, Kongsted A3, Ferreira M3, Maher C1, Kent P1
1The George Institute for Global Health; Sydney Medical School, University of Sydney, Sydney, Australia
2Discipline of Physiotherapy, Faculty of Health Sciences, University of Sydney, Sydney, Australia
3Research Department, Clinical Locomotion Network Science, Spine Centre of Southern Denmark, Hospital Lillebaelt, Middelfart, Denmark and Institute of Regional Health Services Research, University of Southern Denmark, Odense, Denmark

Questions: Do levels of leisure time physical activity predict clinical outcomes in people seeking care for chronic and persistent low back pain (LBP)?

Design: Prospective observational study.

Participants: A total of 915 consecutive patients presenting with LBP to an outpatient Spine Center in secondary care were recruited. Approval was received from the Regional Scientific Ethics Committee (Project ID 5-200110000-29).

Outcome Measures: Separate multivariate linear regression analyses were performed to investigate whether levels of leisure time physical activity (i.e. sedentary, light and moderate-to-vigorous leisure time physical activity levels) predict pain and disability at 12 months follow-up, after adjusting for age, pain, episode duration, disability, neurological symptoms, depression and fear of movement.

Results: Final models showed evidence of an association between baseline physical activity and 12 month outcomes (p < 0.001). In both models, the moderate-to-vigorous physical activity group reported less pain and disability compared to the sedentary group.

Conclusion: Our findings suggest that physical activity levels may have a role in the prognosis of LBP. Specific domains of physical activity warrant further investigation to better understand this association.

Key Practice Points:
• This study demonstrated that levels of physical activity during leisure time in people seeking care for LBP were a significant predictor of pain and disability at 12 month follow-up.
• This study generates evidence that physical activity levels may have a role in the prognosis of LBP.
• Further research is needed to understand which specific domains of physical activity can influence the prognosis of patients with LBP.

THE RELATIONSHIP BETWEEN THE MECHANISM OF HAMSTRING INJURY, THE LOCATION OF INJURY AND RETURN TO PLAY

Pizzari T1, Taylor RB2,3, Coburn P2
1School of Physiotherapy, La Trobe University
2Mill Park Physiotherapy Centre
3Alphington Sports Medicine Clinic

Question: Does the mechanism of hamstring injury predict the location of injury or time to return to football?

Design: Observational study.

Participants: Seventy-five Australian Football League players with hamstring muscle injuries.

Outcome Measures: Mechanism of hamstring injury, location of injury on MRI, time to return to sport.

Results: The majority of strains occurred during high speed running (24%) or when combining running with lumbar flexion (16.5%). A number of injuries occurred with acceleration (8.8%) and no specific mechanism was reported in 17.6% of cases. There was no clear relationship between mechanism of injury and resultant location of injury within the muscle. The mean return to playing time was 25 days, with the majority of players (57%) returning to play at 21 days and 20% returning to play at 14 days. Players who sustained an acceleration injury were 8.8 times (p = 0.04) more likely to play more than 25 days following the injury. Comparatively, where no specific mechanism of injury could be described the players were almost 8 times more likely
The reliability of an audit tool to evaluate the safety and effectiveness of cardiorespiratory weekend interventions of junior physiotherapists

Polmear CM1, Holdsworth C1, Skinner EH1,2,3
1Western Health, Melbourne
2Monash University, Melbourne
3The University of Melbourne, Melbourne

Question: Is a purpose-designed clinical record audit tool reliable in evaluating safety and effectiveness of junior physiotherapists’ weekend interventions in cardiorespiratory wards and intensive care?

Design: Retrospective audit of the clinical record. Institutional ethical committee approval was received (QA2012.100).

Method: A purpose-designed clinical record audit tool was developed. 60 physiotherapy clinical notes from weekend or public holiday interventions were extracted from clinical records, deidentified and audited by eight senior cardiorespiratory physiotherapists.

Participants: Clinical notes from 22 junior physiotherapists working weekends in acute cardiorespiratory wards and intensive care were audited.

Outcome Measures: The purpose-developed tool consisted of 15 questions and measured safety and effectiveness of assessment and treatment in dichotomous yes/no answers. The tool was developed by senior cardiorespiratory physiotherapists, who considered relevant domains including assessment and treatment safety and effectiveness, and intervention appropriateness for weekend service.

Results: The tool demonstrated varying degrees of intra-rater reliability (Kappa ranged from 0.304 to 0.606) and inter-rater reliability (Kappa ranged from 0.122 to 0.649) in assessment and treatment safety, effectiveness, and appropriateness for weekend service. Treatment safety and assessment safety had the highest intra-rater and inter-rater reliability respectively. Treatment effectiveness and treatment safety had the lowest intra-rater and inter-rater reliability respectively.

Conclusion: The tool demonstrated varying levels of reliability in evaluating safety and effectiveness in cardiorespiratory wards and ICU. Its use may be limited by lack of minimum standards for users to reference and by the extent to which notes reflect what occurred. Further development, validity and reliability testing of the tool are necessary.

Key Practice Points:
• A clinical notes audit tool demonstrated varying reliability in assessing safety and effectiveness of junior physiotherapists’ weekend cardiorespiratory interventions.
• The tool is limited by: a lack of minimum standards for weekend cardiorespiratory practice and the extent to which notes reflect what occurred.
• The tool requires further testing.

Proprioceptive deficit at the ankle joint correlates with limb laterality recognition

Pourkazemi F1, Hiller C1, Raymond J1, Nightingale J1, Refshauge K1
1School of Physiotherapy, Faculty of Health Sciences, University of Sydney, NSW, Australia
2School of Exercise and Sport Sciences, Faculty of Health Sciences, University of Sydney, NSW, Australia

Question: Does a proprioceptive deficit at the ankle joint correlate with results of a limb laterality recognition task?

Design: Cross-sectional observational study.

Participants: Twenty five participants with proprioceptive deficits (either movement detection or joint position sense deficits) at the ankle joint.

Outcome Measures: Proprioception: movement detection accuracy at the ankle joint while randomly moved into inversion or eversion with three different velocities (0.1 °/s, 0.5 °/s, 2.5 °/s), joint position sense accuracy measured by average angular error while replicating the contra-lateral ankle position. Limb laterality recognition task: response time and accuracy of making left or right judgements of foot pictures.
Results: Poorer movement detection is moderately correlated to number of correct responses during a limb laterality recognition task ($r=0.423$, $p=0.023$). No correlation was found between accuracy of joint position sense and response time or accuracy while recognising the laterality of foot pictures ($r=0.178$, $p=0.395$).

Conclusion: Participants with a movement detection deficit at the ankle joint have less accurate responses during limb laterality recognition task.

Key Practice Points:
• Proprioception deficits have varied effects in different people, eg, effecting joint position sense or movement detection
• It has been suggested that proprioception deficits can disrupt the model of the limb used by brain for movement.
• Disruption of this model may also predispose patients to reinjury.

USE OF ELECTROPHYSICAL AGENTS BY PHYSIOTHERAPISTS IN PAPUA NEW GUINEA: A DEVELOPING COUNTRY CONTEXT

Ramalingam PK1, Milanese S2
1 Senior Lecturer, Department of Physiotherapy, Divine Word University, Papua New Guinea
2 Lecturer, School of Health Sciences, University of South Australia, Adelaide

Question: How physiotherapists in Papua New Guinea (PNG) use electrophysical agents (EPA) in their clinical management?

Design: Cross sectional observational study.

Participants: National physiotherapists who are working in the health sector.

Outcome Measures: A purpose built questionnaire was adapted for a telephonic interview, based on the systematic review conducted on the articles published between 1960 and 2011. The availability and use of EPA and their educational implications were collected.

Results: A response rate of 79% was achieved. Eighty-eight percent of the participants were from hospitals. Commonly available and used modalities were heat and cold, ultrasound, electrical stimulator and transcutaneous electrical nerve stimulators. All participants had access to heat and cold and just three quarters had access to ultrasound. Over 50% of participants agreed EPA as an essential priority, where less than half of participants were partially confident in using these modalities. University education and clinical guidelines had a greater influence in use of EPA. The frequency used modalities including interterferential currents and infra-red were considered as essential for physiotherapy curriculum. The non-use or non-availability of modalities was due to funding, lack of knowledge and unfamiliarity.

Conclusion: This is the first study to investigate the availability and use of EPA after inception of physiotherapy profession in PNG. The perceptions in using EPA by PNG physiotherapists were similar to the physiotherapists in developed countries. However, the usage patterns were different due to the limited resources in the country.

PHYSIOTHERAPY eSKILLS TRAINING ONLINE RESOURCE IMPROVES PERFORMANCE OF PRACTICAL SKILLS: A CONTROLLED TRIAL

Preston E1, Ada L1, Dean C2, Stanton R2, Waddington G1, Canning C3
1 University of Canberra
2 University of Sydney
3 Macquarie University

Question: Does the Physiotherapy eSkills Training Online resource in addition to usual teaching improve the performance of practical skills in physiotherapy students?

Design: Non-randomised controlled trial.

Participants: Graduate entry physiotherapy students enrolled in consecutive semesters of a neurological physiotherapy unit of study.

Intervention: The experimental group received the Physiotherapy eSkills Training Online resource as well as usual teaching. The Physiotherapy eSkills Training Online resource is an online resource incorporating (i) video-clips of patient-therapist simulations; (ii) supportive text describing the aim, rationale, equipment, key points, common errors and methods of progression; and (iii) a downloadable PDF document incorporating the online text information and a still image of the video-clip for each practical skill. The control group received usual teaching only.

Outcome Measures: Overall performance of practical skills as well as their individual components, measured using a practical examination.

Results: The implementation of the Physiotherapy eSkills Training Online resource resulted in an increase of 1.6 out of 25 (95% CI −0.1 to 3.3) in the experimental group compared with the control group. In addition, the experimental group scored 0.5 points out of 4 (95% CI 0.1 to 1.1) higher than the control group for effectiveness of the practical skill and 0.6 points out of 4 (95% CI 0.1 to 1.1) higher for ‘rationale for the practical skill’.

Conclusion: There was improvement in performance of practical skills in students who had access to the Physiotherapy eSkills Training Online resource in addition to usual teaching. Students considered the resource to be very useful for learning.

Key Practice Points:
• Online video simulations based on clinical scenarios should be considered for use in teaching and learning practical skills.

IS PARENT AND TEACHER DELIVERED INTERVENTION EFFECTIVE FOR FOUR YEAR OLD CHILDREN WITH DEVELOPMENTAL COORDINATION DISORDER?

Pridham L, Hillier S, Esterram A
University of South Australia

Question: Is parent and teacher delivered intervention effective for four year old children with developmental coordination disorder?

Design: Cluster randomised controlled trial with blinded outcome assessment.

Participants: Fifty-eight four year old children with developmental coordination disorder.

Intervention: A physiotherapist collaboratively developed five goals with the intervention children’s parents (n = 30). Activity ideas for children’s goals were then given to each child’s parent and teacher recommending that they engage the child in the activities for four 15 minute periods per week at home and two at preschool for 12 weeks. The physiotherapist telephoned parents fortnightly and visited preschools twice. The usual care group (n = 26) attended preschool only.

Outcome Measures: The primary outcome of motor performance was assessed using the Movement Assessment Battery for Children. The Pictorial Scale of Perceived Competence and Social Acceptance assessed the secondary outcome of children’s perceived competence and social acceptance. The Canadian Occupational Performance Measure assessed changes in intervention parents’ perceptions of their child’s performance and satisfaction with it.
Results: Difference in motor competence scores between the groups was not significant (p = 0.77) following intervention. Mean scores for perceived competence and social acceptance were higher for the intervention group but only reached significance for maternal acceptance (p = 0.03). Intervention increased parents' rating of their children's performance and satisfaction with it (p < 0.0001).

Conclusion: The intervention did not improve children's motor competence more than usual care but did positively influence children's perceived maternal acceptance and parents' perceptions of their children's performance.

Key Practice Points:

• The intensity of intervention was insufficient to change the motor competence of all children with developmental coordination disorder
• Engaging parents in intervention appears to have a positive impact on children's perceptions of acceptance by their mothers
• Intervention may promote parents' ongoing support for their child with developmental coordination disorder

BARRIERS AND FACILITATORS TO EBP USE BY PHYSIOTHERAPISTS WORKING IN STROKE REHABILITATION – DEPLOYMENT AND IMPLEMENTATION OF A TOOL

Pugh J1, Smith J2, Morgan P3
1Monash University, Frankston, Australia
2Peter James Centre, Eastern Health, Victoria

Question: What are perceived barriers and facilitators to evidence based practice (EBP) within stroke rehabilitation?

Design: Part 1: Focus groups; Part 2 online questionnaire.

Participants: Monash University clinical partners and/or members of National Neurology Group (APAN) working within stroke rehabilitation.


Results: Part 1: Using a Delphi method, questionnaire refinement occurred. Part 2: Seventy-two respondents working across various settings (acute 55.8%; rehabilitation 72.2%; nursing homes 9.7%; community/home based rehabilitation 50.0%; other 6.9%) completed the questionnaire (>1 location could be selected). Overall, respondents were highly experienced (mean 15.8 years post-graduation) and 90.2% had searched for stroke clinical practice guidelines. Eighty-two percent had inadequate time to read research at work. Forty percent agreed there are insufficient resources available in their workplace for the implementation of new practices. More experienced respondents (Md 29.0 years post-graduation) were more likely to disagree with “the implications of research for practice were made clear” than less experienced respondents (Md 12.5 years post-graduation, p = 0.009). There was no significant difference between those working in acute care compared to those working across all other sites and level of agreement with “there are insufficient resources or equipment available for the implementation of new practice” (p = 0.963).

Conclusion: A questionnaire exploring barriers and facilitators to EBP use was developed that meets the needs of Australian physiotherapists working in stroke care. Despite advances in online access and promotion of guidelines, experienced physiotherapists encounter barriers to EBP implementation.

Practice points:

• Australian physiotherapists working in stroke rehabilitation access stroke clinical practice guidelines
• Despite greater online access, physiotherapists report having limited time to read stroke research both at work and outside of work
• Younger physiotherapists are more likely to agree that ‘the implications of research for practice were made clear’

NEW INSIGHTS INTO NECK PAIN-RELATED POSTURAL CONTROL USING WAVELET ANALYSIS IN OLDER ADULTS

Quek J1, Brauer SG1, Clark R3, Treleaven J4
1University of Queensland
2Australian Catholic University

Question: Can modern signal processing method reveal new insights into complex postural control mechanisms in older adults with neck pain (ONP) compared to healthy controls (OHC)?

Design: Cross-sectional comparison study.

Participants: Forty female older adults with (n=20) and without (n=20) neck pain.

Outcome Measures: Performance-based balance measures were assessed using Timed Up-and-Go (TUG) and Dynamic Gait Index (DGI). Standing postural control with eyes open and closed was characterised by the centre-of-pressure anterior-posterior movements measured using a force platform. Modern balance measures (wavelet analysis) were calculated.

Results: The ONP group demonstrated poorer functional performance (TUG and DGI, p<0.01) than the OHC. Wavelet analysis revealed that standing postural sway in the ONP group was positively skewed towards lower frequency movement (very low [0.10-0.39Hz] frequency content, p<0.01) and negatively skewed towards moderate frequency movement (moderate [1.56-6.25Hz] frequency content, p=0.012).

Conclusion: Our results demonstrate that ONP have poorer balance than OHC. Furthermore, wavelet analysis may reveal greater insights into postural control mechanisms. Given that centre-of-pressure signal movements in the very low and moderate frequencies are postulated to be associated with vestibular and muscular proprioceptive input respectively, we speculated that because ONP demonstrate a diminished ability to recruit the muscular proprioceptive system compared to OHC, they rely more on the vestibular system for postural stability.

Key Practice Points:

• Older adults with neck pain demonstrate postural control deficits when compared with healthy individuals.
• Modern signal processing method using wavelet analysis may reveal mechanisms underlying postural control deficits in neck pain.
• Deficits in proprioceptive input may underlie neck pain-related postural control impairments.

MULTIDIMENSIONAL PAIN PROFILES IN FOUR CASES OF CHRONIC NON-SPECIFIC AXIAL LOW BACK PAIN

Rabye M, O’Sullivan P, Beales D, Slater H, Smith A
Curtin University, Perth

Biography: Martin Rabye is a Specialist Musculoskeletal Physiotherapist at Body Logic Physiotherapy in Perth. He is currently mid-way through his PhD at Curtin University in Perth, examining multidimensional pain profiles in people with chronic axial low back pain.

Question: Do patients with chronic axial low back pain have different multidimensional pain profiles? Do these profiles conflict with contemporary low back pain classification systems?

Participants: Four case reports representative of a larger cohort.

Outcome Measures: Multidimensional pain profiles of four subjects with chronic axial low back pain will be presented based upon validated questionnaires evaluating demographic, pain characteristic, psychological, social, lifestyle and general health dimensions; quantitative sensory testing and video analysis of movement and pain behaviours.

Results: Each multidimensional pain profile highlights differing mechanisms and dimensions likely to be relevant to the maintenance of chronic pain and disability in these cases. In one case movement appears the predominant dimension influencing symptoms. Two subjects present with similar, high levels of psychosocial, lifestyle and general health dimensions, suggesting differences in underlying mechanisms and dimensions. The fourth case offers a “mixed” presentation with both the movement and psychosocial dimensions appearing to influence the presentation. These cases will be examined in relation to whether or not contemporary low back pain classification systems are able to classify these individuals, and subsequently guide
their management. It will be postulated that management must be based upon the thorough examination of the multiple relevant dimensions that may influence a patient’s pain profile.

**Conclusion:** The examination of multidimensional pain profiles in patients with chronic axial low back pain highlights the heterogeneity within this patient group, and may facilitate appropriately targeted interventions.

**Key Practice Points:**
- It is important to examine all potentially relevant dimensions in patients with chronic low back pain – pain characteristics, psychological, social, lifestyle, general health, sensory testing, movement analysis.
- This may better facilitate appropriately targeted intervention.
- Contemporary low back pain classification systems may be inadequate to guide intervention in some cases.

**USING E-HEALTH IN CARDIORESPIRATORY PATIENT CARE**

**Rabey M, O’Sullivan P, Beales D, Slater H, Smith A**

**Curtin University, Perth**

**Biography:** Martin Rabey is a Specialist Musculoskeletal Physiotherapist at Body Logic Physiotherapy in Perth. He is currently mid-way through his PhD at Curtin University in Perth, examining multidimensional pain profiles in people with chronic axial low back pain.

**Question:** Do patients with chronic axial low back pain have different multidimensional pain profiles? Do these profiles conflict with contemporary low back pain classification systems? Design / Participants: Four case reports representative of a larger cohort.

**Outcome Measures:** Multidimensional pain profiles of four subjects with chronic axial low back pain will be presented based upon validated questionnaires evaluating demographic, pain characteristic, psychological, social, lifestyle and general health dimensions; quantitative sensory testing and video analysis of movement and pain behaviours.

**Results:** Each multidimensional pain profile highlights differing mechanisms and dimensions likely to be relevant to the maintenance of chronic pain and disability in these cases. In one case movement appears the predominant dimension influencing symptoms. Two subjects present with similar, high levels of psychosocial, lifestyle and general health factors associated with their condition. However examination of their sensory and movement profiles reveals marked differences, suggesting differences in underlying mechanisms and dimensions. The fourth case offers a “mixed” presentation with both the movement and psychosocial dimensions appearing to influence the presentation. These cases will be examined in relation to whether or not contemporary low back pain classification systems are able to classify these individuals, and subsequently guide their management. It will be postulated that management must be based upon the thorough examination of the multiple relevant dimensions that may influence a patient’s pain profile.

**Conclusion:** The examination of multidimensional pain profiles in patients with chronic axial low back pain highlights the heterogeneity within this patient group, and may facilitate appropriately targeted interventions.

**Key Practice Points:**
- It is important to examine all potentially relevant dimensions in patients with chronic low back pain – pain characteristics, psychological, social, lifestyle, general health, sensory testing, movement analysis.
- This may better facilitate appropriately targeted intervention.
- Contemporary low back pain classification systems may be inadequate to guide intervention in some cases.

**ARE PHYSIOTHERAPY LED SCREENING CLINICS COST EFFECTIVE?**

**Comans T, Rebbeck T, O'Leary SP, Smith DP, Scuffham P**

1 Centre for Applied Health Economics, School of Medicine, Griffith University, Logan
2 Physiotherapy Department, Royal Brisbane and Women’s Hospital, Metro North Hospital and Health Service
3 NHRMC Centre for Clinical Research Excellence in Spinal Pain, Injury and Health, University of Queensland, Brisbane
4 Physiotherapy Department, Ipswich Hospital, West Moreton Hospital and Health Service

**Question:** Is the Orthopaedic Physiotherapy Screening Clinic and Multi-disciplinary service cost effective in improving orthopaedic services in Queensland?

**Design:** A pilot study to develop a cost-utility model to compare the cost effectiveness of physiotherapy led services to a traditional orthopaedic service.

**Participants:** Retrospective chart and audit data were used from 980 patients with a primary diagnosis involving the knee, shoulder and lumbar spine seen in the physiotherapy led service between July 2008 and June 2010.

**Outcome Measures:** A Markov model developed in TreeAge Pro 2011® was used to synthesise data describing patient clinical pathways, outcomes and costs. Utility values were calculated from Quality of Life scores, administered pre and post management, and then used to derive Quality Adjusted Life Years. Costs and probabilities were calculated from data obtained in the retrospective audit where possible or estimated using published data and expert opinion.

**Results:** The base case incremental cost-effectiveness ratio of $557 suggests that the physiotherapy led service could be considered highly cost-effective based on a commonly accepted cost-effectiveness threshold of $50,000. Sensitivity analysis indicates that the model is not sensitive to variations in cost but is likely to be highly sensitive to variations in the probability of success of treatment.

**Conclusion:** This pilot study indicates the Orthopaedic Physiotherapy Screening Clinic service model could be considered highly cost-effective. However, these preliminary results are tempered by the lack of available data on costs and effects of usual care orthopaedic services. A fully informed prospective analysis using the economic model developed has commenced.

**Key Practice Points:**
- The Orthopaedic Physiotherapy Screening Clinic and Multi-disciplinary Service is a complementary model of care for patients referred to Specialist Orthopaedic Outpatient services who previously endured lengthy delays in accessing care.
- Pilot modelling suggests the physiotherapy led service is likely to be highly cost effective.

**CLINICAL RATINGS OF PAIN SENSITIVITY CORRELATE WITH QUANTITATIVE MEASURES: A COMPARISON BETWEEN PATIENTS WITH CHRONIC NECK PAIN AND HEALTHY CONTROLS**

**Rebbeck T, Moloney N, Azoory R, Huebscher M, Waller R, Beales D**

**Question:** Do clinical tests of pain sensitivity correlate with quantitative tests in patients with chronic neck pain or whiplash?

**Design:** Cross-sectional study

**Participants:** 40 patients with chronic neck pain and 40 age matched controls.

**Intervention:** Quantitative tests undertaken were cold pain thresholds (CPT using MSA Thermal Stimulator) and pressure pain thresholds (PPT using a pressure algometer). Clinical tests for cold sensitivity were an application of ice (rated 0-10 for cold and pain), whilst clinical tests for pressure sensitivity were manual palpation applied at different pressures (rated 0-10 for pain). All tests were undertaken at standardised local (neck and upper trapezius) and remote (tibialis anterior) sites.

**Outcome Measures:** Mean differences (95%CI) were calculated between neck pain and control groups and correlation coefficients were calculated between quantitative and clinical measures.
Results: Significant differences were found between neck pain patients and controls for all variables at most sites (eg mean difference PPT at neck = 136.3 kPa (95%CI 76.8 to 195.7 p < 0.001); mean difference CPT at neck = -9.32 °C (95%CI-12.91 to -5.72 p<0.001)). Significant moderate correlations were found between PPT and clinical tests of pressure (ranging from -0.307 to -0.525), and between CPT and clinical tests of cold (ranging from 0.324 to -0.451) at the local sites. Significant moderate correlations were found at all sites for CPT and clinical measures of pain (ranging from 0.501 to 0.684).

Conclusion: Clinical measures of pain sensitivity significantly correlate with quantitative measures indicating that pain sensitivity can be detected with simple tests in clinical practice.

Key Practice Points:
• Physiotherapists may be able to use this information to direct appropriate management

DESIGNING A DATABASE FOR CLINICAL PLACEMENT COORDINATION

Redmond CL
Flinders University, School of Physiotherapy, Daw Park

Questions: How can unnecessary repetition of data entry and input errors be minimised? Can photographs be linked to student details? What potential is there for adding electronic assessments in the future?

Design: Design of a relational database.

Results: Data from multiple spreadsheets were transferred to a relational database. Drop down selections and unique identifiers reduced input errors. Forms were used to update and enter data.

Conclusion: Data integrity and reliability were improved, as was the efficiency of the system. The database could be easily queried to produce reports. Tables were linked with one-to-many relationships to minimise data redundancy. There was potential for a front-end web interface to allow for easy collaboration with multiple people.

Key Practice Points:
• Organised data management can improve the efficiency of clinical placement coordination

CHANGES IN CARPAL TUNNEL SYNDROME AND BODILY PAIN FOLLOWING WEIGHT LOSS SURGERY

Redmond C, McNeil J
University of Adelaide, Discipline of Medicine

Questions: Are carpal tunnel syndrome symptoms and bodily pain relieved with weight loss surgery? Do physical strength and activity levels change?

Design: Prospective case series.

Participants: Thirteen patients who had undergone weight loss surgery after assessment in public hospital obesity services.

Outcome Measures: Grip strength, questionnaires (SF-36v2 and DASH) and self-reported symptoms and activity levels.

Results: It was common to present with symptoms consistent with carpal tunnel syndrome (n=5, 38%), or with pain that interfered with daily activities and affected the knee (n=6, 46%), lumbar spine (n=5, 38%), shoulder (n=4, 31%), foot or ankle (n=3, 23%), hip (n=2, 15%), neck (n=2, 15%), wrist (n=2, 15%) or elbow (n=1, 8%). Prior to surgery there was variation in the quantity and quality of activity that occurred in the participants’ daily lives. Most patients found it difficult to engage in regular exercise at a moderate level. As weight was lost, musculoskeletal symptoms eased and physical health improved. In contrast, grip strength could decline.

Conclusion: The results show that physical health improves following weight loss surgery. However, strength can decrease after rapid weight loss. Further research is required to investigate if exercise as a co-intervention to surgery can maintain muscle strength and improve patient outcomes.

Key Practice Points:
• Greater attention is needed to managing carpal tunnel syndrome in the context of the individual’s overall health risks and chronic health conditions.
• Individuals may benefit from engaging in safe and effective exercise to maintain muscle mass following weight loss surgery.

UPPER LIMB NEURODYNAMIC TESTING: AN OBSERVATION OF MEDIAN, RADIAL AND ULNAR NERVE STRAIN DURING VARIATIONS OF UPPER LIMB POSITIONING

Manwell J1, Thompson N1, Suzanne SJ1, Reid SA2
1The University of Newcastle, Newcastle
2The Australian Catholic University, North Sydney

Question: Which upper limb position produces the greatest mechanical strain in the radial or ulnar nerves in relation to the other upper limb nerves?

Design: A comparative observational study.

Participants: 10 whole-body embalmed human cadavers (20 limbs).

Outcome Measures: Median, radial and ulnar nerve strain (N) measured using buckle force transducers with the upper limb in varied positions, including the currently accepted tests for the radial (ULNT2b: scapular depression, shoulder internal rotation, elbow extension, forearm pronation, wrist and finger flexion) and ulnar nerves (ULNT3: scapular depression, shoulder abduction/external rotation, elbow flexion, forearm pronation, wrist and finger extension).

Results: The addition of shoulder abduction (40°) and extension (25°), wrist ulnar deviation and thumb flexion to ULNT2b produced the greatest strain in the radial nerve (mean differences between positions ranged from 2 to 10 N, p < 0.01) and the largest difference in strain between the radial and other upper limb nerves compared to all other test positions. The addition of shoulder horizontal abduction to ULNT3 produced the greatest strain in the ulnar nerve (mean differences between positions ranged from 3 to 6 N, p < 0.05) and the largest difference in strain between the ulnar and the other two nerves. For these positions there was excellent intra-rater (ICCs ≥ 0.87) and inter-rater reliability (ICCs ≥ 0.86).

Conclusion: These variations on the currently accepted upper limb neurodynamic tests selectively increase the strain on the radial and ulnar nerves, suggesting they may potentially be more effective in detecting radial and ulnar nerve pathologies.

Key Practice Points:
• These variations of the radial and ulnar nerve neurodynamic tests increase strain on their respective nerves
• Clinical application of these tests may improve detection of radial or ulnar nerve pathology
• Investigations in patients with suspected nerve pathology are required to determine if these tests enhance patient management

Presenting author Biography: Sue Reid is a lecturer at the Australian Catholic University, North Sydney, Australia. She has completed a research masters degree on cervicogenic dizziness and is currently undertaking her PhD on this topic. Sue has presented at several international physiotherapy conferences. Sue has worked in clinical practice as a titled musculoskeletal physiotherapist for over 25 years.

THE TREATMENT OF CERVICOGENIC DIZZINESS WITH MULLIGAN SUSTAINED NATURAL APOPHYSEAL GLIDES AND MAITLAND MOBILISATIONS: WHICH IS MORE EFFECTIVE?

Reid SA1, Callister R2, Katekar M2, Rivett DA2
1The Australian Catholic University, North Sydney
2The University of Newcastle, Newcastle

Question: What are the comparative effects of Mulligan sustained natural apophyseal glides (SNAGs) and Maitland passive joint mobilisations in reducing symptoms of cervicogenic dizziness?

Design: Randomised placebo-controlled trial with concealed allocation, assessor blinding and intention-to-treat analysis.

Participants: Eighty-six individuals with chronic cervicogenic dizziness.
Intervention: Participants received 2-6 treatments of either SNAGs with self-SNAG exercises (n=29) or passive joint mobilisations with range of motion exercises (n=29) or a placebo intervention of a detuned laser (n=28).

Outcome Measures: The primary outcome was intensity of dizziness measured on a visual analogue scale. Secondary outcomes were frequency of dizziness, the Dizziness Handicap Inventory and cervical range of motion. Measures were taken at baseline, immediately post-treatment, 12 weeks and at 12 months.

Results: Both manual therapy groups had less dizziness intensity (p < 0.05) than the placebo group post-treatment and at 12 weeks, and less frequent dizziness at 12 weeks and 12 months. There were no differences in these dizziness measures between the two manual therapy groups at any point. The mobilisation group had a lower dizziness handicap score (p < 0.05) than the SNAG group at 12 weeks. The SNAG group had significantly greater extension movement (p < 0.05) than the mobilisation group at all post-intervention points and greater right rotation post-treatment. There were no adverse effects.

Conclusion: Manual therapy has an immediate and sustained (12 month) effect in reducing cervicogenic dizziness. There was no difference between the two manual therapy groups for dizziness but SNAGs had a greater effect on range of motion.

Trial registration: ACTRN12611000073909

Key Practice Points:
- Maitland mobilisations and Mulligan SNAGs reduce cervicogenic dizziness immediately post-treatment and the effect is maintained for 12 months.
- SNAGs are more beneficial than Maitland mobilisations in improving some cervical ranges of motion in patients with cervicogenic dizziness.
- Manual therapy has no common adverse effects on patients with cervicogenic dizziness.

Presenting author Biography: Sue Reid is a lecturer at the Australian Catholic University, North Sydney, Australia. She has completed a master’s degree in physiotherapy and is currently undertaking her PhD on this topic. Sue has presented at several international physiotherapy conferences. Sue has worked in clinical practice as a titled musculoskeletal physiotherapist for over 25 years.

PATIENT SATISFACTION IN A STUDENT-RUN PHYSIOTHERAPY CLINIC

Reubenson A1, Bargon GM2, Jenkins, SC1

1Curtin University, Perth
2Sir Charles Gairdner Hospital, Perth

Question: Are patients satisfied with student-delivered physiotherapy services within an outpatient musculoskeletal department? What factors influence satisfaction levels?

Design: Cross-sectional survey.

Participants: Patients attending the student clinic over an eight-month period.

Outcome Measures: Patients completed a 31-item survey comprising six subscales (Expectations; Therapist; Communication; Organisation; Clinical Outcome; Satisfaction, rated using a 5-point Likert scale), and one global satisfaction item (7-point scale).

Results: Of 147 eligible patients, 80 (54%) consented to participate. Sixty-five completed questionnaires were received. 100% of patients were satisfied with the service. Data for global satisfaction were collapsed into Satisfied/Very Satisfied (n = 26) and Extremely Satisfied (n = 39). Global satisfaction scores did not differ according to age, gender, degree of chronicity or whether treatment was provided publicly or privately. Patients receiving treatment from ≥ 3 therapists demonstrated less satisfaction than those who received treatment from ≤ 2 therapists (p = 0.002), most likely attributed to factors related to Organisation (p = 0.03) and Communication (p = 0.05). Private patients (n = 12) scored higher on the Expectations (median [inter-quartile range] 4.58 [0.92] vs 4.00 [0.84], p = 0.05) and Communication (4.83 [0.46] vs 4.33 [0.66], p = 0.09) subscales compared to public patients (n = 53).

Conclusion: High levels of satisfaction were found among patients attending the clinic. Patient demographics had little influence on satisfaction levels. Satisfaction scores were lower when treatment had been provided by ≥ 3 therapists. Private patients appear to value communication and expectations more highly than public patients when determining satisfaction levels.

Key Practice Points:
- Patient satisfaction is very high with student delivered care.
- Satisfaction is lower when patients are treated by multiple therapists.
- Private patients appear to value communication and expectations more highly than public patients when determining satisfaction levels.

IDENTIFYING DYSTONIA IN CHILDREN WITH CEREBRAL PALSY

Reynolds K1,2
1Kids Plus Foundation
2ABNDT Association of Stroke

Introduction/background: The movement disorders of cerebral palsy are complex and challenging for clinicians to identify different presentations in order to inform intervention. There has been increased information in the medical literature regarding treatment for dystonia and this requires therapists to recognise and assess accurately in their assessment the presence of dystonia.

Purpose/objectives: To discuss current definitions of dystonia and use clinical examples to develop consensus between therapists about the characteristics of dystonia present within the cerebral palsy. To develop a clinically based understanding of dystonia to be used in identifying when dystonia is present and assist with techniques for assessing dystonia and their use in clinical practice.

Issues/questions for investigation or ideas for discussion:
- How do clinicians identify dystonia – what characteristics do they look for and how do they assess for it?
- How is dystonia distinguished from other movement disorders such as spastic hypertonia or choreo-athetosis?
INTEGRATING CONTINUING PROFESSIONAL EDUCATION WITH CLINICAL PRACTICE REQUIRES ACTIVE PROCESSING OF KNOWLEDGE BY PHYSIOTHERAPISTS

Seddon T, Reynolds K
Monash University, Melbourne

Question: How do Health Professionals change their clinical practice following continuing professional education?

Design: Qualitative, inductive approach using semi-structured interviews. Analysis of interview transcripts was used to generate themes using professional identity as a way to view how health professionals represent themselves within their role.

Participants: 4 health professionals who had completed the Foundation Bobath Course within the past 2 years and were currently working in paediatric therapy within Australia.

Outcome Measures: The concept of professional identity was used as a way to understand how therapists make clinical decisions about their practice and service delivery. The interviews were used to generate discussion about the transition period experienced by therapists in the initial three months returning to work once they had completed the Bobath course.

Results: Identity is formed through the continuous interaction and active integration of knowledge and experience, and is jointly formed through individual and social processes of professional development. Professional identity informs clinical practice and is constantly re-negotiated through processes of learning that occur formally and informally within the social and cultural context of workplaces. Knowledge developed through continuing professional education is only one part of the process of improving clinical expertise.

Conclusions: For continuing professional education to have an impact on professional identity therapists must be supported through the process of learning. This process is ongoing and involves all stakeholders including workplace colleagues, supervisors, training providers and the individual.

Key Practice Points:
• Professional learning is an ongoing process occurring through continuous integration and adaptation of knowledge to changing context.
• Developing knowledge for use within clinical practice requires physiotherapists to adopt the role as learner and actively engage in the learning process.
• Greater interaction between training providers and workplace organisations is required to support transfer of knowledge.

DISCORDANCE BETWEEN DISTANCE AMBULATED AS PART OF USUAL CARE AND FUNCTIONAL EXERCISE CAPACITY IN CRITICAL ILLNESS SURVIVORS

Ricardo A1, Hill K1, Jenkins S2,1, Johnston C1, Mackney JH1
1The University of Newcastle, NSW
2Curtin University, Perth

Questions: How much ground-walking is undertaken by inpatients recovering from critical illness within one week of discharge from an intensive care unit? Is there a relationship between the amount of walking undertaken and an individual’s exercise capacity?

Design: observational study.

Participants: Twenty-three critical illness survivors following discharge from intensive care.

Outcome Measures: Participant characteristics were recorded. Within one week of discharge, functional exercise capacity was measured using the six-minute walk test. The documented maximum distance that participants ambulated prior to the six-minute walk test, during a single physiotherapy treatment session was recorded.

Results: Participants were aged 57 (SD 11) years and 14 (61%) were males. Acute physiology and chronic health evaluation II score was 24 (IQR 14) and intensive care length of stay was 11 (IQR 7) days. The six-minute walk distance was 179 (SD 101) metres and was measured 6 (IQR 1) days following discharge from intensive care. The maximum distance ambulated during a single treatment session was 35 (IQR 70) metres and was documented 1 (IQR 1) day prior to the six-minute walk test. The distance participants ambulated was associated with the six-minute walk distance (r = 0.542, p = 0.008). The maximum distance ambulated expressed as a percentage of the six-minute walk distance was 29 (IQR 34)%.

Conclusion: Many survivors of critical illness ambulated at a low percentage of their measured exercise capacity. The use of objective measures to assist with exercise prescription could potentially lead to improved outcomes in this population.

Key Practice Points:
• Many critical illness survivors ambulated at a low percentage of their exercise capacity
• Objective measures to aid accurate exercise prescription may lead to improved outcomes

IMPACT OF MOBILISATION ON THE DAY OF SURGERY ON READINESS FOR DISCHARGE AND HOSPITAL STAY FOLLOWING ELECTIVE HIP REPLACEMENT

Ridley R1, Visser M2, Edmondston SJ1, Headford J1, Yates P4
1Physiotherapy Department, Osborne Park Hospital, Perth
2Physiotherapy Department, Fremantle Hospital and Health Services, Perth
3School of Exercise & Health Science, Edith Cowan University, Perth
4Department of Orthopaedic Surgery, Fremantle Hospital and University of Western Australia, Perth

Question: What is the effect of mobilisation on the day of surgery on readiness for discharge and length of hospital stay following elective hip replacement (HR)?

Design: Randomised controlled trial with concealed allocation.

Participants: 126 patients who underwent elective HR, and met the criteria for mobilisation on the day of surgery were randomly allocated into 2 groups.

Intervention: The experimental group were mobilised out of bed on the day of surgery. Both groups received the same post-operative medical management, and physiotherapy treatment.

Outcome Measures: The primary outcomes were length of hospital stay, and time to readiness for discharge.

Results: The early mobilisation group were ready for discharge 63 (SD = 15) hours post-surgery, compared to 70 (SD = 18) hours for the control group (p=0.03, 95% CI 0.7 to 12.8). Hospital stay was not significantly different in the early mobilisation group (77 hours) (SD = 30) compared to the control group (87 hours) (SD = 35) (p=0.11, 95% CI -2.1 to 21.6). Patients mobilised on the day of surgery were 1.8 times (p=0.103, 95% CI -1.2 to 2.7) more likely to be discharged at any time following surgery. Eighty percent of patients with a hospital stay of greater than 96 hours were in the control group (p <0.0001).

Conclusion: Mobilisation on the day of HR surgery significantly decreases the time to readiness for discharge, and significantly increases the probability of discharge compared to mobilisation on the day after surgery.

Key Practice Points:
• Mobilisation on the day of surgery reduces the time to readiness for discharge following elective hip replacement.
• The probability of discharge from hospital at any time post-surgery is significantly higher in patients mobilised on the day of surgery.
• Patients mobilised on the day of surgery are significantly more likely to be discharged from hospital within 96 hours of the surgery than patients mobilised the day after surgery.
BARIATRIC CHALLENGES IN THE WORKPLACE: BIGGER AMBULANCES, LONGER SEAT BELTS, STRONGER AND WIDER FURNITURE AND INCREASED RISK OF INJURY

Helen Robertson

Introduction/background: The 2011-12 health survey, released by the Australian Bureau of Statistics, show 63 per cent of adults are overweight (35 per cent) or obese (28 per cent). The obesity rate in Australia has more than doubled over the last 20 years, with Australia now being 7th in the world 'Globesity' race. Obesity affects all age groups. How does this impact on Physiotherapists and the services they provide?

• Acute hospital and rehab Physiotherapists with the main aim of mobilising patients for discharge are now exposed to higher injury risk with greater weights and loads to handle. They need to rely on using specialist equipment and additional staff numbers to stay injury free.

• Private practice physiotherapists need to ensure their furniture and treatment couches are wide enough and strong enough to bear the weight of heavier clients. Treatment methodology is challenged as bony landmarks are no longer palpable and larger patient’s joint co-ordination patterns, centre of gravity and joint range are restricted or influenced by their weight, body shape and medical comorbidities.

• Aged care and community care physiotherapists need to ensure their mobility care plan assessments and exercise programs are safe for care workers to perform with larger clients.

How do we as Physiotherapists encourage obese patients and workers adopt a healthy lifestyle, stay fit for work and injury-free? How do we encourage larger patients and clients to seek out our services?

Do we need to review our approach to treating obese patients in relation to changing our treatment focus and being more supportive and understanding of their weight issues?

Purpose/objectives: To provide an overview of safe management of the bariatric patient or client in several physiotherapy work areas, including risk assessment, equipment provision and limits on providing services.

To reinforce the need for physiotherapists to provide empathetic, safe and equitable treatment for larger and bariatric clients.

To provide an overview of current research and resources for physiotherapists to safely manage the obese or bariatric patient or client.

Issues/questions for investigation or ideas for discussion: More obese patients are having knee or hip replacement surgery. Mobilising these patients post-surgery is becoming increasingly difficult for Physiotherapists because of the patient’s weight and deconditioning. What can we do as physiotherapists to better manage such patients other than to recommend they lose weight pre surgery? (ie pre op conditioning).

A 200kg person needs to be transported to Day centre for rehab and socialisation. She is transported in a Toyota Camry in the front passenger seat. She just fits in but is encroaching into the driver’s side and the seat belt with extension just goes around her. Is she safe to be transported in this manner? She is mainly independent but what happens if she falls or needs help to get out of the car?

Implementation of Interventions to Prevent Musculoskeletal Injury at Work – A Behaviour Change Approach

Rothmore P, Karnon J, Aylward P

*Discipline of Public Health, School of Population Health, University of Adelaide

†Discipline of General Practice, School of Population Health, University of Adelaide

Question: Is there an increase in the implementation of injury prevention advice if it is tailored according to behavior change theory?

Design: Purposive sampling was used to select organisations at increased of musculoskeletal injury. Organisations were asked to identify discrete workgroups of 10-20 employees performing similar tasks for inclusion in the study. These workgroups were subsequently randomised to either the control or intervention arm.

Participants: 25 workgroups (comprising 405 workers).

Intervention: Each workgroup was visited and, based on direct observation and discussion, a written report outlining the behaviour change profile of the workgroup. Company managers were interviewed approximately one year later to evaluate their implementation of the advice.

Outcome Measures: The primary outcome was the proportion of recommendations implemented. Secondary outcome measures included the type of recommendations implemented (higher or lower order) and their timing.

Results: After 12-months those who had received tailored advice had implemented a greater proportion of total changes (p = 0.013); a greater proportion of lower order controls (p = 0.024) and had done so in a shorter time-frame (p = 0.027).

Conclusion: There is evidence that tailoring injury prevention according to behaviour-change principles improves the implementation of this advice within organisations. Ethics: Approval for this study was granted by the University of Adelaide, Human Research and Ethics Committee.

Acknowledgements: This project was funded by SafeWork SA.

Key Practice Points:

• Tailoring injury prevention advice to organisations is feasible.

• The tailoring of injury prevention advice according to behaviour change theory may improve its implementation.

• Even when advice is tailored organisations are more likely to implement lower rather than higher order controls.

DO PHYSIOTHERAPISTS NEED TO HAVE KNOWLEDGE ABOUT INFANT-MOTHER ATTACHMENT WHEN WORKING WITH INFANTS AND THEIR MOTHERS?

Robinson B

Physiotherapy Service For Babies & Toddlers

Question: Do physiotherapists need to have knowledge about the infant-mother attachment when working with infants and their mothers?

Design: Observational study.

Participants: 280 infants with gross motor delay seen in the presence of their mothers over a five year period.

Intervention: Intervention was provided with the mother present. The physiotherapist observed the interaction between infant and mother during the course of treatments. Observation included mother’s physical handling of the infant and how well or less well the mother adapted to her infant’s signals in general.

Outcome measure: The components of the relationship assessment included how well infant and mother were adapted to play and laugh together, to be sad and angry together, to be in tune with each other, and for the mother to provide a physical and emotional feeling of safety and comfort. Components of a less well adapted relationship included one or both being avoidant or intrusive, difficulties to manage conflict, sustained feeling of tension, and not being in tune with each other.

Results: Infants who appeared well adapted with their mothers were easier to motivate and to engage in exercising. Programs of exercises were likely to succeed when infants and mothers had a good attachment.

Conclusion: Research has shown that any infant development, including gross motor development, occurs in the context of relationships. Health professionals, including physiotherapists, working with infants in the presence of their mothers need to have a good understanding / training in the principles of attachment to achieve optimal treatment outcome.

Key Practice Points:

• Sound understanding of early gross motor development

• Sound understanding of brain development

• Attachment theory – Circle of Security map
VALIDITY OF SMART PHONE ACCELEROMETER MEASURES OF POSTURAL SWAY

Rumore AJ, Waddington G, Cathcart S
Faculty of Health, University of Canberra, Canberra

Question: Are Smart Phone accelerometer postural sway measures valid when compared to those of a computerised force plate?

Design: Single, within-participant experimental design.

Participants: Fifty adults (30 females / 20 males).

Intervention: Participants performed five balance tests – 3 static (single leg, comfortable and narrow stance) and 2 dynamic (normal and tandem walking), whilst being simultaneously measured for postural sway (tri-axial) by the accelerometer and force plate.

Outcome Measures: Frequency spectral analysis measures (filtered 0 -12 Hz) of mean standard deviation (SD), root mean squared error (RMSE), and Fast Fourier Transform mean (FFT-Mean) and maximum (FFT-Max) frequencies.

Results: FFT-Mean recorded 11 significant Pearson’s r correlation results between the accelerometer and force plate measures (r = .282 – .527; p < 0.01), SD and FFT-Max measures each recorded 8 (r = .285 – .785; p < 0.01), whilst RMS measure recorded only 1 (r = .330; p < 0.05). Further analysis of FFT-Mean demonstrated significant Pearson’s r correlation results in all three axial directions for the single leg stance and tandem walking balance tests (r = .297 – .488; p < 0.01). Although FFT-Mean produced 4 significant Pearson’s r correlation results for both the antero-posterior (AP) and medio-lateral (ML) directions, the AP direction produced a stronger correlation for all balance tests, except tandem walking (r = .458 – .527; p < 0.01).

Conclusions: Smart Phone accelerometer quantitative postural sway measures are valid when compared to those of the computerised force plate. Stronger correlations were evident as sway measures are valid when compared to those of a computerised force plate.

Key Practice Points:
• There is a trend for minimal foot clearance on the affected limb to be reduced in people with stroke.
• Minimal foot clearance was more variable in people with stroke, compared with healthy controls.
• People with stroke may be at greater risk of trips.

FALLS IN THE FIRST MONTH FOLLOWING DISCHARGE FROM REHABILITATION

Said CM1,2, Blennerhassett JM1, Batchelor F3, Dorevitch M1, Smith P1, Judd E1, Langford Z1
1 Austin Health, Heidelberg
2 The University of Melbourne, Parkville
3 National Aging Research Institute, Parkville

Questions: What proportion of people fall and what is the rate of falls in the first month following discharge from rehabilitation?

Design: Prospective observational study. Study approved by Austin Huami Research Ethics Committee.

Participants: One hundred and thirty three participants (mean age 75.8 years, SD = 11.8; 57% female) who were discharged home following inpatient rehabilitation (subacute LOS 19.6, SD = 13.9 days) at Austin Health were recruited. Participants were contacted by a physiotherapist one month post-discharge to determine whether they had fallen during this time period.

Outcome Measures: Falls in the month post discharge. Clinical data, including admission diagnosis, admission and discharge FIM scores, length of stay and falls in hospital were also collected.

Results: Follow up data was available for 126 participants. Ten participants (7.5%) fell within a month of discharge, with two participants falling more than once. The falls rate was 3.2 falls / 1000 days, which is higher than the reported falls rate of 1.4 falls per 1000 days in the general older population. Post hoc testing found no association between falls in hospital and falls post discharge (Fisher exact test p = .275).

Conclusion: The rate of falls was high in the first month following discharge from rehabilitation. Follow up over a longer time period, using falls calendars, would increase our understanding of the falls rate in this high risk population.

Key Practice Points:
• People discharged home from rehabilitation have a high falls rate in the month post discharge.
• People who fell in hospital were no more likely to fall on discharge than people who had no hospital falls.
• Clinicians should consider assessing falls risk and implementing strategies prior to discharge.

IS MINIMUM FOOT CLEARANCE DURING THE SWING PHASE OF WALKING ALTERED IN PEOPLE WITH STROKE?

Said, CM1,2, Tirosh, O3, Galea, MP5, Begg, R4
1Physiotherapy, The University of Melbourne
2Physiotherapy Department, Austin Health, Heidelberg
3College of Sport and Exercise Science & Institute of Sport, Exercise & Active Living (ISEAL), Victoria University, Footscray
4Department of Medicine (Royal Melbourne Hospital), The University of Melbourne, Parkville

Question: Is minimum foot clearance during swing phase of walking altered in people with stroke?

Design: Observational comparative study.

Participants: Seventeen people with subacute stroke (mean age 66.5 years, SD = 14.2). Study approved by Austin Human Research Ethics Committee.

Outcome Measures: Three dimensional motion analysis was used to obtain minimum foot clearance during swing phase of walking, via a reflective marker on the forefoot.

Results: In people with stroke, mean minimum foot clearance was 2.9 cm (sd = 0.9) on the affected limb and 3.4 cm (sd = 1.3) on the unaffected limb, although paired t tests revealed this difference was not significant (p = .223). Minimal foot clearance for controls was 3.3 cm (sd = 0.3), although this did not significantly differ from people with stroke.

Conclusion: People with stroke tended to have reduced minimum foot clearance on the affected side, and as a group their minimum foot clearance was more variable than healthy controls. As a result, people with stroke may be at greater risk of tripping when walking. This study was limited as it had a small sample size, which when combined with the greater variability in participants with stroke, limited the power of the study. Also, there were insufficient strides available to determine how variable minimum foot clearance is from stride to stride (within-person variability). Further investigation of minimum toe clearance following stroke is warranted.

Key Practice Points:
• People with stroke may be at greater risk of trips.

BIOFEEDBACK GAIT TRAINING TO REDUCE TRIPPING PROBABILITY IN PEOPLE WITH STROKE: A CASE STUDY

Tirosh O1, Said C1,2, Steinberg N1,2, Galea, M. P5, Begg R4
1College of Sport and Exercise Science & Institute of Sport, Exercise & Active Living (ISEAL), Victoria University, Footscray
2Physiotherapy Department, Austin Health, Heidelberg
3Zinnman College of Physical Education and Sport Sciences at the Wingate Institute Netanya, Israel
4Department of Medicine (Royal Melbourne Hospital), The University of Melbourne, Parkville

Question: Can biofeedback gait training increase minimal toe clearance and reduce the trip risk in people with stroke?

Design: Single case study, pre-post test design; assessments at baseline, post-training and one month post training. Approved by Austin Human Research Ethics Committee.
An RCT is required to determine whether this novel gait training biofeedback can be successfully used following stroke to modify key practice points:

- Minimum toeclearance should be conducted.
- This was partially retained at 1 month (21±9 mm). The probability of tripping over a 1 cm obstacle at minimum toeclearance was reduced variability (baseline 16±12 mm post-training 24±8 mm).
- Training increased mean minimum toeclearance and reduced trip risk.

An RCT is required to determine whether this novel gait training is effective and leads to clinically important improvements.

PREPARING PEOPLE AT HIGH RISK OF FALLS FOR DISCHARGE HOME FOLLOWING REHABILITATION: DO WE MEET THE GUIDELINES?

**Said C,1 Batchelor F1,2 Shaw K,1 Blennerhassett J3**

1 Austin Health, Heidelberg
2 The University of Melbourne, Parkville
3 National Ageing Research Institute, Parkville

**Question:** Do people receiving inpatient rehabilitation with high falls risk receive appropriate falls risk factor assessment and management?

**Design:** Retrospective medical record audit. Approved by Austin Human Research Ethics Committee.

**Participants:** Medical records of 121 people admitted for rehabilitation were screened to identify 50 patients discharged home and at high falls risk.

**Outcome Measures:** National fall prevention guidelines were used to develop an audit tool of falls risk factors and strategies.

**Results:** Rehabilitation patients at high risk of falls received an average of six out of 16 potential fall prevention strategies. Most common strategies were physiotherapy interventions including mobility, strength and balance training (n=47) and occupational therapy interventions including functional retraining and home assessments (n=46). There was evidence that postural hypotension and footwear were assessed in less than 20% of records. Correspondingly few strategies addressing postural hypotension (n=3) and footwear (n=4) were recorded. For 49 patients there was no documentation of a vision assessment within two years, and documentation of falls education was present in only seven files. Discharge paperwork correctly identified falls risk for only 10 of the 50 patients.

**Conclusion:** While some strategies, such as exercise, were provided to people at high risk of falls during rehabilitation, there was little evidence of comprehensive risk factor assessment or management. Only 20% of patients were correctly flagged as high risk of falls at discharge. While documentation may not always reflect clinical practice, this study highlights a need for improvements in assessment, management and communication of falls risk for rehabilitation patients.

**Key Practice Points:**

- There was little evidence that people at high falls risk who are discharged home receive comprehensive management of their falls risk.
- Falls risk was not always communicated to services on discharge.
- There is a clinical need for structured assessment and management for people at risk of falls.

USE OF THE BUBBLE POSITIVE EXPIRATORY PRESSURE DEVICE BY PHYSIOTHERAPISTS IN AUSTRALIAN HOSPITALS

**Santos MD1,2, Eisenhuth J1, Milross MA1, Alison JA1,3**

1 Prince of Wales Hospital, Randwick
2 University of Sydney
3 Royal Prince Alfred Hospital, Sydney

**Questions:** How widespread is the use of the bubble positive expiratory pressure (PEP) device in Australian hospitals? What is the rationale for its use?

**Design:** Self-administered questionnaire.

**Participants:** Physiotherapists managing respiratory patients at 122 Australian hospitals were invited to participate. This included 100 randomly selected hospitals from Australian states stratified by hospital size and national distribution, plus all paediatric and tertiary hospitals.

**Outcome Measures:** Forty-one questions investigating the clinical rationale and use of bubble-PEP devices, and device assembly.

**Results:** Hospital response rate was 88% (n=107) with 169 participating physiotherapists. Bubble-PEP was used in 46 (43%) of all surveyed hospitals, representing 37% of surveyed state hospitals, 86% of surveyed children’s hospitals, 60% and 75% of surveyed ACT and NT hospitals, respectively. Seventy-two percent (n=121) of responding physiotherapists used bubble-PEP to improve ventilation (59%), cough clearance (39%), secretion clearance (39%), oxygen saturation (48%) and promote deep breathing (48%). In bronchiectasis (86%), pneumonia (74%), COPD (70%) and post-operatively (61%). Physiotherapists believed that bubble-PEP splinted airways open (88%), produced PEP at the mouth (70%) and loosened secretions (66%). Seventy-seven percent of physiotherapists were more likely to use bubble-PEP than other devices due to accessibility and cost. Materials used to construct bubble-PEP were a 500 mL bottle for irrigation (54%); suction tubing (77%) of 30 cm length (46%) and 10 cm water level (34%), which was believed to generate 10 cmH2O pressure (56%).
**BARRIERS TO THE PROVISION OF PESSARY CARE IN AUSTRALIAN CONTINENCE AND WOMEN’S HEALTH PHYSIOTHERAPY PRACTICE FOLLOWING A PESSARY TRAINING WORKSHOP**

**Scammell AE, Burnett AM, Neumann PB, Thompson J, Briffa NK**

**Question:** What are the barriers to the provision of pessary care in the management of women with pelvic organ prolapse reported by Continence and Women’s Health practitioners following a pessary training workshop?

**Intervention:** Continence and Women’s Health practitioners, with advanced clinical skills, who attended a pessary training workshop, were sent a specifically designed questionnaire 3, 6 and 12 months following training and asked to describe the barriers to their use of pessaries in clinical practice. Qualitative analysis was undertaken.

**Results:** Eighty (81.6%) of the 98 participants who attended the workshops were Continence and Women’s Health physiotherapists. Thirty-six (45%) physiotherapists provided feedback. Barriers to change could be clustered into four main categories: professional issues such as lack of confidence and need for more training; clinical issues in private practice including costs and practice organization; difficulty accessing appropriate support from medical colleagues; and structural (established medical service delivery models in the public sector).

**Conclusion:** Continence and Women’s Health physiotherapists who attended a pessary training workshop identified a number of barriers to implementing pessary care in their clinical settings. These barriers must be explored and addressed before pessary management can be widely provided by Continence and Women’s Health Physiotherapists in the Australian health care setting.

**Key Practice Points:**
- Continence and Women’s Health physiotherapists identified a number of barriers to their incorporation of pessary care in their clinical practice settings.
- These barriers need to be addressed to extend the scope of Continence and Women’s Health physiotherapy to include pessary fitting in line with international initiatives.

**HACKING THE HUMAN BRAIN**

**Schabrun S**

**NHMRC Clinical Research Fellow, The University of Western Sydney, Honorary Senior Fellow, The University of Queensland**

Physiotherapists have the potential to ‘hack’ into the human brain using therapies that strengthen or weaken important synaptic connections (i.e. neuroplasticity). Promoting neuroplasticity may enhance clinical outcomes in a range of musculoskeletal and neurological conditions. An exciting and innovative approach is the use of neuromodulatory therapies, such as non-invasive brain stimulation and peripheral electrical stimulation, to ‘prime’ the human brain. Priming is thought to increase the brain’s receptiveness to traditional physical therapies by elevating neural excitability immediately prior to training. Our research has provided early evidence that this approach improves pain and function in clinical conditions beyond that which can be achieved by traditional therapy alone. This presentation will outline our current understanding of the neuroplastic changes present in chronic musculoskeletal and neurological conditions; provide examples of novel neuromodulatory therapies being trialed in clinical populations and discuss current controversies and future directions in this exciting field.

**COMBINED BRAIN AND BACK STIMULATION IMPROVES PAIN AND FUNCTION IN CHRONIC LOW BACK PAIN**

**Schabrun SM, Jones E, Elgueta Cancino EL, Hodges PW**

**The University of Queensland, School of Health and Rehabilitation Science, Brisbane**

**Question:** Does non-invasive brain stimulation combined with peripheral electrical stimulation improve i) pain and function and ii) central sensitisation and cortical organisation in chronic low back pain (LBP)?

**Design:** A placebo controlled crossover design with participant blinding and random allocation

**Participants:** Sixteen individuals with chronic LBP

**Intervention:** Participants received four 30 minute interventions inclusive of active or sham transcranial direct current stimulation (primary motor cortex; 1mA; anodal) and active or sham peripheral electrical stimulation (site of worst pain; noxious intensity; 10 Hz), across separate sessions, in random order. The four interventions were: i) tDCS/PES, ii) tDCS/sham PES, iii) sham tDCS/PES or iv) sham tDCS/sham PES.

**Outcome Measures:** Pain severity, Schober test of forward flexion range of motion, pressure pain thresholds, 2-point discrimination and transcranial magnetic stimulation derived motor cortical maps

**Results:** Pain reduced immediately following each of the three active interventions (p = 0.03) but not following sham (p = 0.1). The combined tDCS/PES intervention improved forward flexion (p = 0.002) and pressure pain thresholds at the site of pain (p = 0.03), whilst both the combined intervention and PES alone improved 2-point discrimination (both p < 0.01). Motor cortical organization of the back muscles improved following the combined tDCS/PES intervention.

**Conclusion:** A combined tDCS and PES intervention can improve motor cortical organisation of the back muscles and reduce central sensitisation to a greater extent than either intervention applied alone. These changes are associated with improved pain and function in chronic LBP. Novel therapies that target mechanisms of central sensitisation and cortical organisation may be effective in chronic LBP.

**Key Practice Points:**
- A combined tDCS/PES intervention improves cortical organisation and reduces central sensitisation in chronic LBP
- A combined tDCS/PES intervention improves pain and function in chronic LBP beyond that of either intervention applied alone
- Novel therapies that target central sensitisation and cortical organisation may be effective in chronic LBP.

**UNDERSTANDING THE BRAIN IN THE TRANSITION FROM ACUTE TO CHRONIC LOW BACK PAIN**

**Schabrun SM, Jones E, Elgueta Cancino EL, Hodges PW**

**The University of Queensland, School of Health and Rehabilitation Science, Brisbane**

**Biography:** Dr Siobhan Schabrun is a NHMRC Clinical Research Fellow at The University of Queensland. She holds an undergraduate degree in Physiotherapy from The University of South Australia and a PhD in neuroscience from The University of Adelaide. Her research focuses on neuroplasticity for learning and function in those with musculoskeletal and neurological disorders. She was the recipient of the NHMRC/Australian Academy of Science early career researcher award for the highest ranked clinical fellowship application in 2010 and received a Queensland Young Tall Poppy Scientist of the year award for excellence in science and science communication in 2011.

**Question:** At what stage in the transition from acute to chronic low back pain (LBP) do cortical abnormalities develop and how do these relate to symptom chronicity?

**Design:** A prospective, longitudinal cohort study. Individuals with an acute episode of LBP were recruited and outcome measures taken within one month of pain onset and again at 2, 4 and 6 months follow-up.

**Participants:** Nine individuals with an acute episode of LBP

**Outcome Measures:** Pain severity (numerical rating scale), Oswestry Disability Index and transcranial magnetic stimulation derived motor cortical maps
Results: Group mean pain severity scores were 4.3±2.0 within one month of pain onset, 1.8±0.3 at 2 months, 1.1±1.3 at 4 months and 2.6±2.8 at 6 months. Three individuals had pain that persisted at 6 months. Our data demonstrate an enlarged area of the back muscles in the primary motor cortex and a change from two discrete areas of cortical representation to a single smudged area within the first month of pain onset in those who develop persistent pain. These changes were not present in those whose symptoms resolved.

Conclusion: These data show a lack of discrete cortical organisation of the back muscles that is present early, within the first month of pain, and appears to be unique to those who develop persistent symptoms. This novel finding would be consistent with changes in coordination of the back muscles, such as reduced potential to activate the muscles independently, and points to a link between motor cortical organisation and the persistence of LBP.

Key Practice Points:
- Reorganisation of the primary motor cortex occurs within the first month of LBP onset and is unique to those who develop persistent symptoms.
- The pattern of motor cortical reorganisation would be consistent with changes in coordination of back muscles in LBP.
- Altered motor cortical organisation may underpin persistence/persistence of LBP.

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The pattern of motor cortical reorganisation would be consistent with changes in coordination of back muscles in LBP.

Altered motor cortical organisation may underpin persistence/persistence of LBP.

Lower Extremity Functional Scale), imaging requirements, medications and patient satisfaction were used. Measures were taken at discharge from the emergency, two and six weeks post discharge.

Results: Eighty-eight patients (52 male, 59%) with a mean age of 34 years (SD 12) were included in the lower limb group. At discharge, one of 44 patients (2.3%) received opioids in the physiotherapy group compared to six of 44 patients (13.6%) in the non-physiotherapy (medical and nurse practitioners) group (p = 0.05). Eighty percent in the physiotherapy group compared to six of 44 patients (13.6%) in the non-physiotherapy group received imaging (p = 0.04). The back pain group included 29 patients (16 male, 55%) with a mean age of 34 years (SD 12) were included in the lower limb group. At discharge, one of 44 patients (2.3%) received opioids in the physiotherapy group compared to six of 44 patients (13.6%) in the non-physiotherapy (medical and nurse practitioners) group (p = 0.05). Eighty percent in the physiotherapy group compared to six of 44 patients (13.6%) in the non-physiotherapy group received imaging (p = 0.04). The back pain group included 29 patients (16 male, 55%) with a mean age of 34 years (SD 12). At discharge, the physiotherapy group used less imaging (p = 0.04) and patients received less anti-anxiolytics (p = 0.02) compared to the non-physiotherapy group. Both physiotherapy groups at six weeks were more satisfied with their care compared to the non-physiotherapy groups, (p = 0.03 in both groups). There was no difference in functional outcomes or pain.

PREDICTORS OF PROLONGED EMERGENCY DEPARTMENT LENGTH OF STAY (OVER 4 HOURS) IN PATIENTS PRESENTING WITH MUSCULOSKELETAL BACK PAIN

Schulz PA1,2, Fiore JF3, Holland AE1,2
1Sandringham Hospital
2Alfred Hospital
3La Trobe University, Melbourne

Question: Which factors predict prolonged emergency department (ED) length of stay (LOS) in patients presenting with musculoskeletal back pain (MBP)?

Design: Retrospective observational study.

Participants: Patients with MBP who presented to the ED of either of two urban hospitals.

Outcome Measures: Prolonged ED LOS (greater than 4 hours), as determined by National Emergency Access Target.

Results: A convenience sample of 160 consecutive patients was included in the analysis (80 male, mean age 49 years). Fifty-two patients (32.5%) had an ED LOS greater than 4 hours. In a univariate analysis, seven factors were found to be potential predictors of prolonged LOS (p < 0.1): type of presentation (self-presentation or ambulance), time to assessment from triage (in hours), time to analgesia from triage (in hours), patient age, referral for medical assessment, referral for specialist review (e.g. orthopaedics) and request for imaging. Independent predictors on multivariate analysis were: time to assessment (OR 3.08, 95% CI 1.52 to 6.21, p = 0.002) and patient age (OR 1.05, 95% CI 1.02 to 1.09, p = 0.009).

Conclusion: Delayed assessment and older age increase the likelihood of ED LOS greater than 4 hours in patients presenting with MBP. This result suggests that time to assessment from triage is the most relevant modifiable predictor of prolonged LOS in ED. The implementation of strategies to reduce waiting periods should be a priority for ED’s aiming to achieve the National Emergency Access Target. Primary contact musculoskeletal physiotherapists working in the ED have the potential to expedite time to assessment in this patient population.

PATIENTS IN THE EMERGENCY DEPARTMENT RECEIVE LESS IMAGING AND MEDICATIONS, AND ARE MORE SATISFIED WHEN SEEN BY A PHYSIOTHERAPIST

Harding P1, Schulz PA1, Prescott J1, Shifman J2, Fiore JF3,4
1Physiotherapy Department, The Alfred Hospital, Melbourne
2Physiotherapy Department, St Vincent's Hospital, Melbourne
3Physiotherapy Department, La Trobe University Clinical School, Melbourne

Question: Does a musculoskeletal physiotherapist in the emergency department improve patient outcomes when compared to other health professionals?

Design: Prospective observational study.

Participants: Patients with lower limb injuries or low back pain who presented to the emergency department of a metropolitan hospital.

Outcome Measures: The Numerical Pain Rating Scale, patient functional outcome questionnaires (Roland Morris and Lower Extremity Functional Scale). Imaging requirements, medications and patient satisfaction were used. Measures were taken at discharge from the emergency, two and six weeks post discharge.

Results: Eighty-eight patients (52 male, 59%) with a mean age of 34 years (SD 12) were included in the lower limb group. At discharge, one of 44 patients (2.3%) received opioids in the physiotherapy group compared to six of 44 patients (13.6%) in the non-physiotherapy (medical and nurse practitioners) group (p = 0.05). Eighty percent in the physiotherapy group compared to six of 44 patients (13.6%) in the non-physiotherapy group received imaging (p = 0.04). The back pain group included 29 patients (16 male, 55%) with a mean age of 34 years (SD 12). At discharge, the physiotherapy group used less imaging (p = 0.04) and patients received less anti-anxiolytics (p = 0.02) compared to the non-physiotherapy group. Both physiotherapy groups at six weeks were more satisfied with their care compared to the non-physiotherapy groups, (p = 0.03 in both groups). There was no difference in functional outcomes or pain.
Conclusion: Patients in the physiotherapy group were more satisfied with their care and were less likely to be imaged or receive medications.

Key Practice Points:
• Patients seen by physiotherapists were more satisfied with their care compared to patients seen by other health professionals.
• Patients seen by physiotherapists were less likely to be imaged or receive medications whilst in the emergency department.
• Patient functional outcomes or pain was no different between the physiotherapy and non-physiotherapy group.

CARDIOPULMONARY RESPONSES DURING SIX MINUTE WALK TEST DIFFERENTIATES FUNCTIONAL IN PULMONARY ARTERIAL HYPERTENSION: A TERTIARY CENTRE EXPERIENCE

Seale H1, Harris J2, Hall K1, Kermeen F1, Morris NR1,2
1Queensland Lung Transplant Service, The Prince Charles Hospital, Brisbane
2School of Rehabilitation Sciences, Griffith University, Gold Coast

Question: What is the relationship between disease severity and cardiopulmonary exercise test (CPET) measures during a 6 minute walk test (6MWT) in pulmonary arterial hypertension?

Design: Prospective observational study.

Participants: Sixty-five (46F, 49 ± 16 yr) from a tertiary pulmonary hypertension centre.

Outcome Measures: 6MWT whilst gas exchange measured using portable metabolic cart. End exercise oxygen up take (VO2), ventilation (V), breathing efficiency (V/VO2 – BE) and end tidal CO2 (PETCO2), heart rate (HR), oxygen saturation (SpO2) and breathlessness were determined from 60s data average. All patients underwent echocardiography and standard measurements of right ventricular function including right ventricular systolic pressure (RVSP). New York Heart Association functional class (NYHA-FC) determined independently by attending physician.

Results: Significant difference in 6MWD, and NYHA-FCII versus III (II: 531 ± 108 vs III: 407 ± 92, p < 0.05). At end exercise there was a significant difference in CPET measures between NYHA-FCII vs FCIII (VO2: II: 14.8 ± 4.1, III: 10.3 ± 2.4 ml kg⁻¹ min⁻¹); V: II: 47.8 ± 17.2 III 39.5 ± 15.7 l min⁻¹); BE (II: 0.2 ± 7.6, III: 45.7 ± 8.9, P1 CO2 (II: 26.9 ± 4.3, III: 24.7 ± 4.5 mmHg). Right ventricular systolic pressure was significantly higher for FC-III group (II: 72 ± 22 and III: 81 ± 29 mmHg).

Conclusions: End exercise breathing efficiency and P1 CO2 are sensitive to pulmonary arterial hypertension disease severity and may be useful in evaluating the response to specific pulmonary hypertension therapy.

Key Practice Points:
• Cardiopulmonary exercise with 6 minute walk test adds further information to exercise limitation in pulmonary arterial hypertension and may be more sensitive to disease progression, severity and response to therapy.

DAY OF SURGERY PHYSIOTHERAPY POST JOINT REPLACEMENT SURGERY – WHAT IS THE EVIDENCE AND THE CHALLENGE OF IMPLEMENTATION

Senserrick C
St Vincents Hospital Melbourne

Introduction: With an ageing population and increased surgical demand, reducing length of stay post joint replacement and returning the patient directly home are high priorities for the multidisciplinary team on the acute orthopaedic ward. Following the introduction of accelerated pathways, there has been increased demand by surgeons and nurse unit managers for physiotherapists to mobilise the patient on the day of surgery. A systematic literature review into the effect of day of surgery mobilisation was completed by the speaker in March 2013. This retrieved 15 papers including randomized controlled trials and a clinical guideline. The appraisal and results will be presented during this session. In some studies the specific role of same day mobilisation was not conclusive due to the co-current introduction of other interventions, such as structured preoperative education, and multimodal perioperative analgesia protocols. However, there was sufficient evidence of benefit and no evidence of harm, for St Vincent’s to develop its own protocol for day of surgery physiotherapy. This will be presented, along with a completed audit of Melbourne hospitals providing current information about day of surgery physiotherapy services.

Purpose: To discuss the evidence available and present the protocol we have developed. Progress, successes and pitfalls physiotherapists have experienced when implementing the protocol will be discussed, as well as the influence of other factors on the accelerated pathway.

Issues for Discussion: Service redesign, overcoming barriers in the public hospital setting, minimally invasive surgery, local anaesthetic infusions, preadmission education.

Key Practice Points:
• There is growing demand by surgeons and nurse unit managers for physiotherapists to treat patients on the day of surgery post joint arthroplasty.
• There is evidence this is beneficial and does no harm.
• Developing protocols for implementing day of surgery physiotherapy.

DEVELOPING A DISCHARGE PREDICTOR TOOL FOR FRATTURED NECK OF FEMURS

Senserrick C
St Vincents’s Hospital Melbourne

Question: Can discharge destination be predicted for patients post surgery for fractured neck of femur?

Design: Prospective observational study.

Participants: 62 patients admitted to the orthopaedic ward with fractured neck of femur.

Outcome Measures: Age, the New Mobility score (based on pre-morbid level of function), the Cumulated Ambulation Score (based on mobility Day 1-3 post-operatively), the presence of confusion post-operatively and discharge destination (home, slow stream or fast stream rehabilitation).

Results: Discharge to slow stream rehabilitation was predicted by the New Mobility Score (cutoff score of 4, sensitivity .87, specificity .7) and age (cutoff of 79 years, with sensitivity .74 and specificity .31). The Cumulated Ambulation Score was the best predictor of discharge home (cut off score of 9, sensitivity .91 and specificity .37). A flowchart incorporating these variables and presence of confusion post operatively was created. This flowchart predicted discharge destination with 81% accuracy on day 3 post operatively.

Conclusion: The discharge predictor flow chart appears to be an accurate tool for prediction of discharge destination. Prediction of discharge destination early after surgery may facilitate discharge processes and reduce length of stay in the acute hospital. Further validation of the tool in a new data set is warranted.

Key Practice Points:
• Discharge destination for fractured neck of femur patients can be accurately predicted using routinely collected clinical data.
• Mobility prior to fracture, progress post surgery and age were significant predictors.
• A simple flowchart can be utilised for early prediction of discharge destination.
WEIGHT STIGMA IN HEALTH CARE: ARE PHYSIOTHERAPISTS IMMUNE?

Setchell J1,2, Gard M3,4, Watson BM1, Jones L1, Briffa NK5
1Physiotherapy Department, School of Health Sciences, Curtin University, Perth
2School of Psychology, Faculty of Social and Behavioural Sciences, UQ, Brisbane
3School of Education, Southern Cross University, Lismore
4School of Human Movement Studies, Faculty of Health Science, UQ, Brisbane
5School of Applied Psychology, Griffith University, Brisbane

Question: Is it likely that physiotherapists stigmatise patients due to their body size and could this affect the way patients are treated?

Design: Cross-disciplinary review of literature.

Participants: Literature was reviewed on the current status of weight stigma generally, weight stigmatising attitudes of health professionals specifically and the effects of weight stigma on treatment of patients including subsequent health outcomes.

Intervention: A review of literature was conducted across numerous disciplines including medicine, psychology, fat studies, sociology and public health. The outcomes, conclusions and relevance to the research question were reviewed in 168 scholarly resources.

Outcome Measures: Overall outcomes of research in scientific literature regarding weight stigma in general, weight stigma by health professionals (including physiotherapists) towards patients, and the impact of this stigma on treatment of patients.

Results: Weight is a salient characteristic for stigma in current times. Weight stigma is prevalent and there are indications that it is increasing. Weight stigma affects recipient's quality of life generally, including their health outcomes. Health professionals demonstrate implicit and explicit weight stigma, which have been shown to relate to differential treatment of patients. There is no literature on physiotherapists and weight stigma.

Conclusion: Literature indicates that weight stigma is prevalent and increasing. Health professionals such as exercise scientists, doctors, dieticians and nurses have consistently demonstrated weight stigma, which is likely to affect patient treatment and subsequent health outcomes. Given these results from similar health professions there is no obvious reason to suspect that physiotherapists will exhibit markedly different attitudes.

Key Practice Points:

• Health professionals' stigmatising attitudes can lead to inferior treatment of stigmatised patients and subsequent poorer health outcomes.

• Unlike other health professions, there is minimal literature available on physiotherapists' attitudes towards their patients, including weight stigma.

• Physiotherapists stand to benefit from understanding how their perceptions of patients influences quality of care.

COMPARING CORE STABILITY AND GENERAL EXERCISE ON CHRONIC LOW BACK PAIN PATIENTS USING THREE FUNCTIONAL LUMBOPELVIC STABILITY TESTS

Shamsi MB1, Akbari M2, Zamanlou M2, Pourahmadi MR2, Saniei Z2
1Lecturer in Kermanshah University of medical sciences, Kermanshah, Iran
2PhD Candidate, Iran University of medical sciences, Tehran, Iran

Question: Using three functional tests for assessment, are effects of core stability exercise and general exercise on lumbar segmental stability different in chronic non-specific low back pain patients?

Design: Randomised controlled trial with alternate allocation and intention-to-treatment analysis.

Participants: Twenty nine non-specific chronic low back pain patients who were referred to physiotherapy department in a local hospital.

Intervention: Two 16 sessions training programs: 1- Core stabilization exercise, 2- General exercise, for two groups.

Outcome Measures: 1- Three lumbar stability functional tests: single leg squat, dip test, and runner pose test. Video was recorded while patients performing these tests before and after the intervention sessions. Three experienced physiotherapist scored test videos according to the rating criteria suggested in a previous study. 2- Pain intensity by visual analogue scale, and 3- Oswestry disability questionnaire.

Results: There was no statistical significant differences between the groups on entry to the trial in pain (p = 0.64), disability (p = 0.70) and tests scores (p = 0.49). Statistical analysis revealed a significant reduction in pain intensity (p < 0.001) and disability level (p < 0.001) and improvement in lumbar segmental stability test scores (p = 0.01) after the intervention. Regarding changes in three outcomes, no significant difference was seen between core stabilization and general exercise groups (p = 0.81), (p = 0.23) and (p = 0.27) respectively.

Conclusion: The present results provide evidence that either two types of training enhances lumbar segmental stability. However, there is no evidence that one type is more effective than the other.

Trial registration: IRCT201111098035N1

TRADITIONAL VERSUS PEER-ASSISTED MODELS OF CLINICAL EDUCATION FOR PAIRED PHYSIOTHERAPY STUDENTS: A RANDOMISED TRIAL

Sevenhuysen SL1,2, Skinner EH3, Farlie MK1,2,3, Raitman L1, Nickson W4, Keating JK4, Maloney S4, Molloy EK2, Haines TP1,3,4
1Allied Health, Monash Health, Clayton
2Health Professions Education and Educational Research Unit, Monash University, Clayton
3Allied Health Research Unit, Monash Health, Clayton
4Department of Physiotherapy, Faculty of Medicine Nursing and Health Science, Monash University, Frankston

Key Practice Points:

1 Specific peer assisted learning activities can be integrated into the clinical education of paired students without compromising performance outcomes.

2 Time should be invested in preparing educators and learners to maximise the benefits of peer assisted learning.

3 Paired student models should incorporate flexibility in the type and number of peer learning activities facilitated.

Question: What is the efficacy and acceptability of two different approaches to the clinical education of paired, entry-level physiotherapy students?

Design: A prospective randomised cross-over trial.

Participants: Monash University physiotherapy students in the third year of a four-year undergraduate degree on placement at Monash Health (n=24), and their clinical educators (n=14).

Intervention: ‘Peer assisted learning’, a standardized series of tools utilized at a minimum frequency by students and educators to facilitate peer interaction using guided strategies.

‘Traditional’ clinical supervision and learning activities that were usual practices of the clinical educators when supervising pairs of students.

Outcome Measures: The primary outcome measure was the Assessment of Physiotherapy Practice (APP). Student performance was rated on the APP by a blinded assessor based on a three hour observation of each student. Secondary outcome measures were APP scores rated by the supervising clinical educator and students (self-assessed). Surveys of clinical educator and student satisfaction with the teaching and learning experience and their workplace statistics were also used.

Results: There was no significant between-group difference in the APP scores of the blinded assessor, the supervising clinical educator or the student. Clinical educators spent significantly less time on direct teaching and more time on non-student related quality assurance activities in the peer assisted learning model. Students received significantly more written feedback in the peer assisted learning model. Clinical educator and student satisfaction was higher using the traditional approach.

Conclusion: Specific peer assisted learning activities can be integrated into the clinical education of paired students without compromising student performance outcomes. Despite comparable outcomes, educators and students were more satisfied with the traditional approach. A larger trial, allowing for greater flexibility in the PAL model, would enable incorporation of feedback and validation.
COMMITMENT TO PRESCRIBED AQUATIC EXERCISES ASSISTED PAIN MANAGEMENT AND FUNCTION IN DIFFUSE DEGENERATIVE CONDITION OF PERIPHERAL JOINTS AND SPINE

Shepherd JM

Question: Has commitment to a predominantly self managed prescribed aquatic exercise program achieved therapeutic aims and goals set out in care plan?

Design: 8 year retrospective review 2005 to 2013.

Participant: Recently retired male aged 56 years at commencement of review. History included significant traumatic injury events contributing to diffuse degenerative changes of spine and peripheral joints. General practitioner’s care plan and therapeutic aims were to maintain active lifestyle, minimize the impact of increasing degenerative changes as patient ages, to assist in minimizing usage of powerful analgesics. The goals of the participant were to assist pain management; maintain functional mobility and quality of life, to self manage.

Intervention: Individually prescribed aquatic exercise program based on comprehensive assessments and manipulation of water for therapeutic purposes. The self managed program comprised specific aquatic exercise techniques as well as functional mobility and fitness components. Individual aquatic therapy intervention was provided on an intermittent basis to manage localized flare ups. Regular program reviews were conducted with program modification as required.

Outcome Measures: Oswestry functional disability questionnaires, visual analogue pain scores, medication records.

Conclusion: The participant reviewed demonstrated a strong work ethic and commitment to the program. Comparisons of outcome measures identified a reduced level of powerful analgesic use and that functional mobility and quality of life had been maintained. Further single case reviews would assist in determining the role of individual prescribed aquatic exercise programs in long term management of pain associated with degenerative joint and spine conditions.

Key Practice Points:
- Comprehensive land and water assessments identify joint and movement dysfunction.
- Outcome indicates the benefits of specifically designed and targeted aquatic exercise.
- Regular clinical reviews identify areas requiring modification and assist motivation for continuing participation.

PELVIC FLOOR DYSFUNCTION: THINKING FROM THE OUTSIDE IN

Sherburn M, Virtue D

The University of Melbourne

Introduction/background: With latest neuroscience encouraging us to think of more central causes for peripheral dysfunction, this session provides a forum to consider central contributing factors to pelvic floor dysfunction.

This PeArLs is for titled and specialist physiotherapists to discuss clinical reasoning approaches to management of pelvic floor dysfunction where the cause is from neural structures and systems outside the pelvis, from the frontal cortex to sacral nerves, and autonomic system pathologies.

Purpose/objectives: The purpose of this session is to enhance the understanding of neural pathologies in the development and maintenance of pelvic floor dysfunction.

By thinking ‘outside the square’, clinicians will consider the impact of various neurological factors which contribute to pelvic floor dysfunction.

Issues/questions for investigation or ideas for discussion: Discuss clinical reasoning processes when the signs & symptoms of pelvic floor dysfunction don’t add up. Our starting point will be the patient with urinary urgency refractory to usual management. What symptoms would lead you to undertake special tests, such as Babinski, lower limb reflexes, and neural provocation tests?

What autonomic nervous system changes occur in obesity, and other pathologies?
What techniques do physiotherapists have to affect change in these pathologies?
Practice points
- Optimal neural control is necessary for optimal pelvic floor function.
- Assess central and peripheral nervous systems when neuropathology is suspected.
- Development of a neurological assessment model would enhance practice.

A VAGINAL TAMPON IN SITU REDUCES FEMALE STRESS INCONTINENCE LEAKAGE, PATIENT-REPORTED SYMPTOMS AND BLADDER NECK MOBILITY DURING PHYSICAL ACTIVITIES

Sherburn M, Tan J

Question: Do women with stress urinary incontinence experience a reduction in urine leakage, patient-reported symptoms and bladder neck movement, with tampon usage?

Design: A cohort design study.

Participants: Thirty-four women over 18 years of age with pure or predominantly stress urinary incontinence.

Intervention: Use of vaginal tampons for three consecutive days. Outcomes measured: Urinary leakage; modified paper towel test, average of three 24-hour pad weigh test, three measurements of bladder neck movement – gamma angle, retrovesical angle and bladder neck descent – measured via transperineal ultrasound imaging. Secondary outcomes: International Consultation on Incontinence Questionnaire – Female Lower Urinary Tract Symptoms (FLUTS), the Incontinence Impact Questionnaire (IIQ), and a 5-point Likert scale for assessing participant acceptability on tampon usage.
Results: Significant differences were found on the paper towel test (p = 0.008), pad weigh test (p = 0.012), IIQ scores (p = 0.060), and FLUTS incontinence symptoms and bother rating scores (p = 0.011 and p = 0.004). On ultrasound, significant differences were found in the gamma angles measured in supine and standing at rest (p = 0.025 and p = 0.001), and with valsalva (p = 0.002 and p = 0.009). High acceptability for tampon use was reported by 47.1% of participants.

Conclusion: When accompanied by a reduction in posterior rotational descent of the urethra, determined using the gamma angle on transperineal ultrasound imaging, a vaginal tampon in situ reduced stress urinary leakage and reported symptoms. Careful patient selection will be an important consideration for effective use of tampons in clinical practice.

Key Practice Points:
• Vaginal tampons provide an effective and readily available support device to reduce urinary leakage during physical activity in women with stress urinary incontinence.
• A likely mechanism is that the tampon provides mid-urethral support reducing posterior rotation of the urethra.
• Transperineal ultrasound assessment can be used to assess patient suitability.

HOME EXERCISE FOR OLDER PEOPLE AFTER HOSPITAL STAYS: EXPLORATION OF INTERVENTION DOSE MOBILITY AND FALLS IN A RANDOMISED TRIAL

Sherrington C1, Lord SR2, Vogler CM3, Close JCT4, Howard K5, Dean CM6, Clemson LT, Barraclough E7, Ramsay E8, O’Rourke SD9, Kirkham C10, Cumming RG11

1 The George Institute for Global Health, University of Sydney, Sydney, NSW, Australia
2 Neuroscience Research Australia, University of NSW, Sydney, NSW, Australia
3 Northern Clinical School, University of Sydney, Sydney, NSW, Australia
4 School of Public Health, University of Sydney, Sydney, NSW, Australia
5 Department of Health Professions, Macquarie University, Sydney, NSW, Australia
6 Faculty of Health Sciences, University of Sydney, Sydney, NSW, Australia

Question: What was the impact of intervention adherence on falls and mobility in a trial of home exercise for older people recently discharged from hospital?

Design: Randomised controlled trial.

Participants: 340 people.

Intervention: An individualised 12-month home exercise program established and progressed during ten home visits from an experienced physiotherapist.

Outcome Measures: Falls measured with monthly calendars. Mobility measured with Short Physical Performance Battery by an experienced physiotherapist.

Results: Pre-planned analyses revealed a significantly greater increase in falls among participants with a faster baseline gait speed (p = 0.01) but no differential effects for cognitive impairment (MMSE score, p = 0.71) or past falls (p = 0.97). Exploratory analyses did not indicate differential intervention impacts for gender (p = 0.86), age (p = 0.88), co-morbidity (p = 0.69), falls efficacy (p = 0.26), walking aid use (p = 0.35), recruitment source (rehabilitation versus acute hospital, p = 0.23), PPA risk of falling score, (p = 0.52), or postural sway (p = 0.24) but found trends towards a greater increase in falls among people with better knee extensor strength (p = 0.08) and those with falls as a presenting condition (p=0.12) or a neurological condition (p = 0.18).

Conclusion: An unsupervised home exercise program appears to increase falls in older people who have been in hospital, particularly those with a faster gait speed. There were no strong differential effects of the intervention for other baseline characteristics.

Trial registration: ACTRN12607000563460.

Key Practice Points:
• Previous studies have found exercise as a single intervention to prevent falls.
• This trial of exercise as a single fall prevention intervention in older people who have been in hospital found a home exercise program to increase fall rates, particularly in people who walked more quickly on admission to the study.
• This important area requires further research.

INCREASED FALLS WITH HOME EXERCISE FOR OLDER PEOPLE AFTER HOSPITAL STAYS: EXPLORATION OF AN UNEXPECTED FINDING FROM A RANDOMISED TRIAL

Sherrington C1, Lord SR2, Vogler CM3, Close JCT4, Howard K5, Dean CM6, Clemson LT, Barraclough E7, Ramsay E8, O’Rourke SD9, Kirkham C10, Cumming RG11

1 The George Institute for Global Health, University of Sydney, Sydney, NSW, Australia
2 Neuroscience Research Australia, University of NSW, Sydney, NSW, Australia
3 Northern Clinical School, University of Sydney, Sydney, NSW, Australia
4 School of Public Health, University of Sydney, Sydney, NSW, Australia
5 Department of Health Professions, Macquarie University, Sydney, NSW, Australia
6 Faculty of Health Sciences, University of Sydney, Sydney, NSW, Australia

Question: Did intervention effects differ according to baseline participant characteristics in our trial of a home exercise program for older people recently discharged from hospital that found fall rates to be increased in the intervention group (incidence rate ratio 1.43, 95% CI 1.07 to 1.93, p = 0.02)?

Design: Randomised controlled trial.

Participants: 340 people.

Intervention: An individualised 12-month home exercise program established and progressed during ten visits from an experienced physiotherapist.

Outcome Measures: Falls measured with monthly calendars.

Results: Significant increases in falls were found in participants with a faster gait speed (IRR 1.43, 95% CI 1.07 to 1.93, p = 0.02). Greater intervention adherence appeared to be associated with greater improvements in mobility but a smaller increase in falls.
MORE CHILDREN WITH DISABILITY, MORE ACTIVE, MORE OFTEN

Shields N1,2
1Department of Physiotherapy, Faculty of Health Sciences, La Trobe University
2Northern Health Services

The title of this presentation comes from a 2011 Victorian government initiative targeting school children and those who infrequently participated in sport and active recreation. This presentation will focus on those who meet both of these criteria: children with disability.

Physical activity is integral to every child’s health and well-being. Participation in physical activity is particularly important for children with disability as it can have a positive impact on their development and future health and life outcomes. Increasing evidence indicates children with disability are less active than their typically developing peers and often do not meet the levels of physical activity recommended by international guidelines. Children with disability are more likely to be obese than their typically developing peers, which puts them at risk of developing chronic health conditions such as insulin resistance and of developing secondary conditions associated with their primary disability such as depression and social isolation.

Evidence shows the benefits of exercise (including aerobic and resistance training), are similar for children with disability. Emerging evidence indicates that interventions can increase the amount of physical activity children with disability do. However, children with disability are less likely to participate in recreational physical activities, exercise, and sports compared to their typically developing peers, despite the known benefits. The reasons for this are complex and include personal, social, environmental, and program barriers.

This presentation will consider the role paediatric physiotherapists have in promoting and facilitating engagement and participation among children with disability in community-based physical activity, exercise, and sport.

PHYSICAL ACTIVITY PROMOTION BY PHYSIOTHERAPISTS: A SYSTEMATIC REVIEW

Shirley D1, van der Ploeg HP1,2, Bauman AE2
1Discipline of Physiotherapy, Faculty of Health Sciences, University of Sydney, Sydney
2Sydney School of Public Health, University of Sydney, Sydney
3Department of Public and Occupational Health, VU University Medical Center, Amsterdam, the Netherlands

Question: Are physical activity intervention/health promotion messages provided by physiotherapists effective in increasing physical activity behaviour and/or improving health outcomes?

Design: Systematic review with data from quantitative studies synthesised in a narrative format.

Participants: Physiotherapists working in any clinical physiotherapy setting providing physical activity interventions or advice to adults over the age of 18 without medical conditions that limit physical activity.

Intervention: Behavioural interventions aimed at increasing physical activity delivered by physiotherapists such as one-to-one counselling/advice or group counselling/advice for physical activity; self-directed or prescribed physical activity or supervised or un supervised physical activity.

Outcome Measures: Participants measured pre and post intervention for physical activity behaviour or cardio-respiratory fitness.

Results: The search strategy yielded 2986 papers of which five were suitable to include in the review. These studies were of low to medium quality as rated by the PEDro scale. Four of the studies included education including benefits of physical activity as an intervention while only two studies included walking/exercise interventions. Overall, there were few statistically significant results, however, some of the studies showed trends that physiotherapists providing physical activity advice and/or walking/exercise interventions may be an effective means of encouraging physical activity in primary care.

Conclusion: There is insufficient evidence to draw conclusions about the efficacy of physiotherapists in physical activity promotion. However, the limited evidence available suggests that physiotherapists are primary care practitioners who may be effective in promoting physical activity to improve health. Well conducted randomized controlled trials are needed to investigate this question further.

Key Practice Points:
- Physiotherapists are underutilised in promotion of physical activity for primary prevention of lifestyle diseases.
- The limited evidence available suggests that physiotherapists might be effective in providing physical activity advice.
- Well conducted randomized controlled trials are needed to investigate this question further.

IMPROVING BALANCE AND STRENGTH IN CHILDREN USING CORE STABILITY GROUP SESSIONS – A PILOT STUDY

Rebekah Shirt1, Joanna Miller2, Barbara Lucas1
1Royal North Shore Hospital, Physiotherapy Department
2Royal North Shore Hospital, Child and Family Health

Question: Are specific core stability exercise groups effective in improving balance and postural control in children with motor and co-ordination deficits?

Design: Eligible children attended a 45 minute group session each week for eight consecutive weeks during the school term. Groups were conducted by two physiotherapists and included a maximum of six participants. Activities focused on core strengthening, transverse abdominus activation training and static and dynamic balance tasks.

Participants: Children aged between 4–7 years with known Developmental Co-ordination Disorder, hypermobility or low muscle tone.

Outcome Measures: Standardised pre and post-test measures were taken on key balance and strength activities including “single-leg-stance”, “walking on a line,” “shuttle run” and “supine-to-stand x 3.” Data was analysed using the paired t-test.

Results: Five children (60% female) mean age 5.6 years (50±1.34) who were predominately right handed (80%) attended the program and were referred for DCD (3/5), epiphyseal dysplasia (1/5) and hypotonia (1/5). Left “single-leg-stance” improved by an average of 4.4 secs (95% CI 0.82 – 7.98), right “single-leg-stance” improved by an average of 2.0 secs (95% CI 0.37 – 3.96), “walking on a line” by an average of 4.0 steps (95%CI 0.074 – 7.93), and “supine-to-stand x 3” by an average of 2.2 secs (95%CI 0.58 – 3.81). Shuttle run showed no significant improvements in 0.2m (95% CI -0.36 – 0.76).

Conclusion: Our preliminary results indicate that specific core stability groups improve balance and postural control in children who present with motor delays. Further improvements are expected with additional group development and information from parent feedback.

Key Practice Points:
- Targeted core stability training in children improves balance and postural control
- Further research using this population is needed to ascertain measurable outcomes and predict long term benefits

DOES PHYSIOTHERAPY (DIRECTED TOWARDS MOBILITY) IMPROVE FUNCTION IN OLDER PEOPLE WITH DEMENTIA?

Simon S, Wortman H, Lenarcic C, Ostberg C, Lawler K

Question: Does physiotherapy (directed towards mobility) improve function in older people with dementia?

Design: A literature review of articles published on CINAHL, EMBASE, MEDLINE, PSYCINFO. Dementia was the main key word and was searched in combination with synonyms for mobility and exercise.

Participants: Over 65 year olds with dementia. Articles were excluded if the subjects had acquired brain injuries, intellectual disabilities, or delirium in the absence of dementia.

Intervention: Physiotherapy intervention included 1:1 therapy or group therapy that was either exercise or functionally based.

Outcomes: Articles selected required an outcome to be related to physical impairment or reduced mobility. Articles were excluded if the outcomes focussed exclusively on cognitive, behavioural, or emotional outcomes, or if the intervention was exclusively pharmaceutical.
Results: Physiotherapy can be effective in clients with dementia. Therapy should be as functional as possible, use simple commands and include visual demonstration. Therapy was most effective when facilitated by clinicians regularly in a repetitive and structured environment. Participation rates were reasonable. These clients may require a longer period of time to improve. There was no evidence suggesting physiotherapy was detrimental. Quality of the evidence was low.

Conclusions: Physiotherapy can be beneficial to clients with dementia. Functional based assessment and treatment were shown to be the most effective. Cognitively impaired clients can achieve results similar to that of cognitively intact clients, but may require a longer length of stay.

Key Practice Points:
• People with dementia can benefit from therapy focussed on function
• People with dementia can achieve gains in function similar to cognitively intact older adults
• People with dementia may need a longer length of stay or length of intervention to achieve their functional goals

PHYSIOTHERAPY LED CLINICS IN NEUROSURGERY: CLINICAL REASONING FOR LOW BACK PAIN AND SCIATICA

Simondson D1, Brock K1, Cotton S2
1 St Vincent’s Hospital Melbourne
2 Melbourne University

Questions: For patients with sciatica referred to the Neurosurgery Clinic, what are the key factors assessed by a primary contact physiotherapy service (PCP) that determine a) whether MRI investigations are ordered and b) whether patients are progressed for neurosurgical opinion?

Design: Prospective observational study.

Participants: Sixty one patients referred to specialist clinics with sciatica, allocated to the physiotherapy led screening clinic at St Vincent’s Hospital.

Outcome Measures: Roland Morris Questionnaire for Sciatica (RM5), clinical neurological findings and lumbar MRI findings were analysed with respect to clinical pathway outcome.

Results: MRI investigations were ordered for 41 cases and was associated with a high RM5 leg score ($p = 0.02$), other variables were not significant. The logistic regression model accurately predicted 75% of cases. Of these 41 cases, 15 progressed to receive interventions under direction from the neurosurgeon.

Conclusion: Those progressed to neurosurgical opinion were likely to have more disabling leg pain and MRI findings indicating nerve root compression.

Key Practice Points:
• This study attempts to analyse the clinical reasoning of a PCP in Neurosurgery.
• The leg pain score of the Roland Morris Questionnaire adapted for Sciatica is a useful outcome measure.
• The evaluation of lumbar MRI by the physiotherapist is a key factor in this advanced practice role.

CHANGES IN WALKING PERFORMANCE IN THE CHRONIC PHASE OF STROKE RECOVERY USING BOTULINUM TOXIN, PHYSIOTHERAPY AND ORTHOTIC MANAGEMENT: TWO LONGITUDINAL CASE STUDIES

Simondson J1,2, Mehari R1,2, Poole D1,2,4, Murdoch H1,4, Kotschet K4, Brock K1,2,3, Murphy D2
1 Physiotherapy
2 Rehabilitation Unit, St Vincent’s Hospital Melbourne
3 St Vincent’s Hospital Subacute Ambulatory Care Service
4 St Vincent’s Hospital Prosthetics and Orthotics
5 Clinical Neurosciences, St Vincent’s Hospital Melbourne

Lower limb spasticity is an impairment which often limits walking following stroke. There is growing evidence for the use of botulinum toxin to treat lower limb spasticity either as a stand-alone treatment or in conjunction with prescription of orthotics and ongoing physiotherapy. This latter combination of therapies is not well represented in the literature, particularly in the chronic phase (>6 months post stroke) of stroke recovery.

Question: How much change occurs in walking performance >6 months after stroke following a combination of botulinum toxin therapy, physiotherapy and orthotic management?

Design: Retrospective observational study.

Participants: Two case studies (participants A and B) were assessed for changes in walking performance during the management phase of botulinum toxin, together with serial casting, orthotic prescription, manual physiotherapy techniques and exercise programs.

Outcome Measures: Walking was assessed on a GAITRite mat in barefoot, shoes and with an ankle foot orthosis. Velocity, step length and single support phases were measured.

Results: Over 7 months, participant A’s walking velocity improved in barefoot walking by 27.2 cm/s (46% improvement) and her affected leg step length by 24.9 cm (89% improvement). Over a period of 17 months Participant B’s walking velocity improved by 28.4 cm/s (107% improvement) using an ankle foot orthosis.

Conclusion: Significant improvement in function, walking speed and pattern can be achieved with combination treatment of botulinum toxin, physiotherapy and orthotics. Further study is required to assess the clinical improvement and functional gains in a larger population.

Key Practice Points:
• Spasticity can limit mobility following a stroke and be a focus of management at any time along the stroke recovery course.
• Botulinum Toxin in combination with physiotherapy and orthotic management is effective in chronic stroke.
• Walking performance improved with the combined intervention.

WHY SHOULD I CARE ABOUT ‘DISABILITYCARE’?

Singer B
Centre for Musculoskeletal Studies, School of Surgery, University of Western Australia

Despite the fact that National Disability Insurance Scheme (NDIS) – now ‘DisabilityCare Australia’ – is the most significant funding reform in the Australian health and human resources sector since the introduction of Medicare in 1975, many physiotherapists are relatively unfamiliar with the implications of this new funding model. This session aims to provide an overview of the processes that lead to the introduction of ‘DisabilityCare Australia’, the current status of the scheme, and the way this model differs, conceptually and in practice, from previous funding arrangements. Specialist neurological physiotherapist, Elizabeth Shannon will outline some of the implications for service providers, particularly in the private sector. Disability advocates will provide an insight into the limitations of current systems of care and support for people with disabilities and their hopes for the future as ‘DisabilityCare’ is rolled out across Australia. It is proposed that all neurological physiotherapists will appreciate the importance of being aware of what ‘DisabilityCare Australia’ is all about and their potential role in shaping this scheme as it develops across the next few years. You should care about ‘DisabilityCare’!
TRIAL OF EARLY ACTIVITY AND MOBILITY IN INTENSIVE CARE: PROSPECTIVE OBSERVATIONAL STUDY PRELIMINARY (INTERIM) RESULTS

Hodgson C1, Webb SJ2, Berney S2, Denehy L1, Harrold M1, Higgins L1, Presnell J1, Saxena M1, Skinner ED1, Young P1, Buhr H1, Bellomo R1
1 Australian and New Zealand Intensive Care Research Centre (ANZIC-RC), Melbourne
2 University of Melbourne, Melbourne
3 Curtin University, Perth
4 The George Institute, Sydney
5 Western Health, Melbourne
6 Wellington Hospital, Wellington
7 Royal Prince Alfred Hospital, Sydney

Questions: Early mobilisation improves strength, function and health related quality of life in intensive care patients but this evidence excludes Australia and New Zealand. What is the current mobility and exercise practice including safety, method, duration, intensity and frequency in Australian and New Zealand intensive care units?

Participants: Two hundred invasively ventilated patients from 12 sites across Australia and New Zealand, ventilated for at least 24 hours with anticipation of two further ventilation days.

Outcome Measures: Mobilisation episode type and duration, including the highest level of activity in intensive care per day while mechanically ventilated; adverse events, time to physiotherapy milestones, barriers to mobilisation, duration of ventilation, intensive care and hospital stay.

Results: Median (IQR) intensive care length of stay was 10 days [6 to 15] with 7 [5 to 9] days of ventilation. At intensive care discharge, 42% of patients had stood; median (IQR) highest level of activity was 5 [1 to 8]; days to sit out of bed was 7 [5 to 9]; Physical Function Intensive Care Test score (endurance) was 5.5 [3 to 9] (normal = 12) and manual muscle test score (strength) was mean (SD) 45 ± 13 (normal 60). The median time to stand was 8 [5 to 10] days.

Conclusion: Australian and New Zealand patients do not frequently mobilise while intubated. The highest level of activity was standing at the time of intensive care discharge. Future randomised controlled trials should test whether early mobilisation can optimise functional recovery in this population.

Trial registration: NCT01674608.

Key Practice Points:
• Australian and New Zealand intensive care patients usually do not mobilise whilst mechanically ventilated.
• This results in intensive care unit-acquired weakness on intensive care discharge.
• Future randomised controlled trials are needed to test the benefit of early goal-directed mobility in this setting.

PHYSIOTHERAPY CLINICAL EDUCATORS AND STUDENTS SPEND THE MAJORITY OF CLINICAL EDUCATION TIME PROVIDING PATIENT TREATMENT AND COMPLETING ADMINISTRATIVE TASKS

Sevenhuyzen S1, Skinner EH2,3,4, Nickson W1, Farlie M2, Raitman L2, Keating JK1, Molloy E1, Maloney S1, Haines TP2
1 Monash University, Melbourne
2 Monash Health, Melbourne
3 Western Health, Melbourne
4 Auckland City Hospital, Auckland

Question: What are the usual clinical education activities undertaken by physiotherapy clinical educators and entry-level physiotherapy students in clinical placements?

Design: Sub-group analysis of a prospective, randomised, cross-over trial with concealed allocation.

Participants: 16 physiotherapy clinical educators and 14 undergraduate physiotherapy students undergoing clinical education patients in a ratio of 1:2 educator:student.

Outcome Measures: Workplace statistics from clinical educators (e.g. time spent on administration tasks; student supervision; quality and research activities) and students (e.g. number of patient treatments, observation time) were recorded by participants daily.

Results: The activities with the highest frequency (occasions per week) for students were patient-related administration, median (IQR) 13 (11 to 15) and working without peer observation but with clinician observation 11 (4 – 15). Clinical educators spent the majority of their time (minutes per week) engaged in patient-attributable activity median (IQR) 955.0 (436 to 1261), non-student related administration median (IQR) 181 (75 to 423) and direct student supervision (270.0 (174 to 480)).

Conclusion: Little attention has been paid to the content and outcomes of usual clinical education. It is difficult to compare new and innovative models of clinical education for usual clinical education may be inconsistent, unstructured and vary across different placement settings. Students were most frequently engaged in administration and treating patients under supervision from clinical educators. The majority of educator time was spent treating patients and in administrative activities. Further studies are required to quantify the benefits of usual clinical education for students and clinical educators and identify the optimal methods of clinical education.

Key Practice Points:
• It is imperative to quantify placement structure and time spent by educators and students during traditional clinical education.
• Administration consumes the majority of non-clinical time of educators and students.
• The proportion of direct student supervision by clinical educators is low and the significance of this is unclear.

HEALTH-RELATED QUALITY OF LIFE IN MECHANICALLY VENTILATED AUSTRALASIAN SURVIVORS OF H1N1 INFLUENZA IS COMPARABLE TO POPULATION NORMS ONE-YEAR FOLLOWING DISCHARGE

Skinner EH1,2,3,4, Haines K1,3, Howie B1, Hodgson C1, Denehy L1, McArthur C3, Seller D3, DiMarco E3, Mulvany K1, Ryan D1, Berney S1,2
1 Western Health, Melbourne
2 Austin Health, Melbourne
3 The University of Melbourne, Melbourne
4 Monash University, Melbourne
5 Auckland City Hospital, Auckland
6 St Vincent’s Hospital, Melbourne
7 Melbourne Health, Melbourne
8 Monash Health, Melbourne

Questions: How does the health-related quality of life of mechanically ventilated Australian adult H1N1 influenza survivors at one year compare to national population normative data?

Design: Prospective observational cohort study.

Participants: Sixty-two patients, diagnosed with H1N1 influenza and mechanically ventilated, were recruited from eleven intensive care units in Australia and New Zealand.

Outcome Measures: Two validated health-related quality of life questionnaires were administered one year after intensive care discharge: Short Form-36 Version 2 and Assessment of Quality of Life. Demographic details were extracted from the Australian and New Zealand Intensive Care Influenza Investigators registry and local intensive care databases.

Results: 48% were male. The median (IQR) age was 42 (29 to 53) years, APACHE II score was 18.0 (14 to 20) and ventilation days were 10.0 (4 to 23). The median (IQR) health utility score at one year was 0.74 (0.57 to 0.92) compared to the age-matched population mean (SD) of 0.81 (0.23). Health-related quality of life domain scores were within the normal population range. Bodily Pain dimension norm-based score of the Short Form-36 was most affected (median (IQR) 44.1 (38 to 51), while 15% of the cohort had not returned to their former working capacity.

Conclusion: This is the first study to measure health-related quality of life in Australasian survivors of H1N1 influenza. Patient-reported outcomes are critical in the evaluation of the efficacy of healthcare service provision. Survivors reported health-related quality of life comparable to the normal population one year following discharge from intensive care.

Trial registration: ACTRN12609001037291.

Key Practice Points:
• Australasian patients surviving severe H1N1 influenza have comparable health-related quality of life to the normal population however this is likely influenced by survivor bias, response bias and loss to follow-up.
• This impairment in this population was clinically insignificant with the majority of the cohort returning to work.
INCONTINENCE, BODY IMAGE, PELVIC FLOOR DYSFUNCTION AND LUMBO-PELVIC PAIN IN POST-NATAL WOMEN WITH DIASTASES OF THE RECTUS ABDOMINUS

Southby AK1,2, Dyon M1, Haines TP3, Rogers K1, Nicholls K1, Jacob A1, MacRae C1, Skinner EH1,2,3
1Monash Health, Melbourne
2Allied Health Research Unit, Monash University, Melbourne
3Western Health, Melbourne

Questions: Does having a clinically important diastasis of the rectus abdominus post-natally affect continence, body image, pelvic floor dysfunction and lumbo-pelvic pain?

Design: Prospective observational study.

Participants: 40 post-natal women with and 60 post-natal women without a clinically important diastasis of the rectus abdominus (six month post-natal follow-up), and 63 women who had never been pregnant (cross-sectional survey).

Outcome Measures: Incontinence (International Consultation on Incontinence Modular Questionnaire); body image (Body Image Disturbance Questionnaire, Multidimensional Body-Self Relations Questionnaire); pelvic pain and dysfunction (Visual Analogue Scale; Pelvic Floor Distress Inventory Short-Form 20); back pain (Roland Morris Questionnaire).

Results: Both diastasis (important and unimportant) groups reported incontinence more than the control group (p = 0.003 and p = 0.03 respectively) however no differences were observed in general body image disturbance (p = 0.05). Women with a clinically important diastasis reported increased pelvic floor dysfunction (p < 0.001) and pelvic pain (p = 0.006) compared to the control group. Women with a clinically important diastasis reported worse mid-torso body image than the control group (p = 0.002). There were no significant differences between groups in back pain.

Conclusion: This longitudinal study demonstrated that women with a clinically important diastasis of the rectus abdominus report only worse body image than women with a clinically unimportant diastasis. The presence of pelvic pain and dysfunction in the clinically important diastasis group suggests that current definitions of the clinical importance of diastasis size need to be reviewed. The presence of a diastasis did not affect lumbar pain.

Key Practice Points:
- Clinical problems may be missed in women not currently considered to have a clinically important diastasis.
- Current definitions of diastasis clinical importance may need to be re-evaluated.
- Post-natal physiotherapy focuses on abdominal muscle retraining however back pain is not affected by diastasis size; continence management could be emphasised instead.

THE EFFECT OF PREHABILITATION COMPARED TO USUAL CARE ON FUNCTIONAL OUTCOME AND HEALTH SERVICE RESOURCE USE IN CLIENTS EIGHT WEEKS FOLLOWING TOTAL KNEE OR HIP ARTHROPLASTY: A PILOT RANDOMISED CONTROLLED TRIAL

Cavill S1, McKenzie K1, Munro A1, McKeever J1, Whelan L1, Biggs L1, Skinner EH1,2,3, Haines TP1,2
1Monash Health, Melbourne
2Allied Health Research Unit, Monash University, Melbourne
3Western Health, Melbourne

Question: What is the effect of prehabilitation before total hip or knee arthroplasty on quality of life and functional outcome?

Design: Pilot randomised controlled trial with concealed allocation, assessor blinding and intention-to-treat analysis.

Participants: 64 people undergoing elective total hip or knee arthroplasty who were likely to be discharged home post-operatively.

Intervention: The experimental group attended twice-weekly, one hour sessions at a community rehabilitation centre for no less than three weeks and a maximum of four weeks prior to surgery. The control group completed their usual care which did not involve any pre-surgical exercise programs.

Outcome Measures: The primary outcomes were the health utility and quality of life as measured by the EuroQol 5D and the Patient-Specific Functional Scale. Secondary outcomes were range of motion, functional mobility (Timed Up and Go Test), length of stay (acute hospital, Rehabilitation In The Home) and requirement for inpatient rehabilitation. Measures were taken before group allocation and eight weeks post-operatively.

Results: There were no significant between-group differences in health utility (main effect of group -0.04 (95% CI -0.16 to 0.08, p = 0.50) and Patient-Specific Functional Scale (main effect of group -0.59 (95% CI -1.8 to 0.6, p = 0.73) but the group-by-joint interaction effects for the TUG time (7.6 (95% CI -0.9 to 16.1, p = 0.08) and the EQ-5D VAS (-18.3 (95% CI -41.1 to 4.5), p = 0.11) were larger. Patients undergoing prehabilitation improved their knee flexion post-operatively by 12.6 degrees (95% CI 5.2 to 20, p = 0.001).

Conclusion: Prehabilitation improved knee flexion but this did not translate into improved functional mobility or quality of life.

TREATMENT OF POTENTIAL ORGAN DONORS USING LUNG MANAGEMENT PROTOCOLS INCREASES THE INCIDENCE OF SUCCESSFUL LUNG TRANSPLANTATION

Raoi C1, Keating J1, Skinner EH1,2,3
1Monash University, Melbourne
2Monash Health, Melbourne
3Western Health, Melbourne

Question: Do lung management protocols affect the transplantation of donor lungs or recipient survival compared to usual care? Do lung management protocols incorporate respiratory physiotherapy techniques? What are the main reasons for failed lung retrieval?

Design: Systematic review with meta-analysis.

Participants: Organ donors in the intensive care unit.

Intervention: Lung management protocols.

Outcome Measures: Number of lungs transplanted, incidence of adverse events, recipient survival.

Results: Four hundred and twenty-seven articles were screened; eight articles met eligibility criteria and four trials had data that could be included in meta-analyses. Odds ratios (95% CI) were calculated. Lung management protocols significantly increased the incidence of lung transplantation compared to usual care (pooled OR 2.03 (95% CI 1.65 to 2.49), p < 0.001). Lung management protocols may convert unsuitable donors. No studies reported adverse events associated with lung management protocols. Only two studies included respiratory physiotherapy. Common reasons for failed lung retrieval included logistical reasons, inadequate oxygenation and presence of radiographic infiltrates, consolidation and atelectasis. Recipient survival at one year was not adversely affected by protocolised interventions (pooled OR 1.52 (95% CI 0.78 to 2.97), p = 0.22). The strength of conclusions was limited by the poor quality of the included articles.

Conclusion: Lung management protocols increased the incidence of successful lung transplantation without compromising recipient survival. There was insufficient evidence to evaluate the contribution of physiotherapy or the protocolised components of respiratory physiotherapy techniques. Future studies should investigate the role of respiratory physiotherapy in successful lung transplantation.

Key Practice Points:
- Lung management protocols increase the proportion of lungs transplanted from organ donors.
- The quality of the studies was poor to moderate and significant heterogeneity was present in the conduct and reporting of the trials.
- Future high-quality large randomised controlled trials will improve the rigor of the conclusions.

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AN INVESTIGATION OF SEDATION, AGITATION AND DELIRIUM LEVELS IN GENERAL INTENSIVE CARE PATIENTS

Skinner EH1,2, Ritchie P3, Barneo K3, Gait P3
1Monash Health, Melbourne
2Allied Health Research Unit, Monash University, Melbourne
3Western Health, Melbourne

Questions: What are the sedation, agitation and pain levels of patients in a general intensive care unit? How frequently do sedation and agitation preclude participation in physical activity? What is the incidence of delirium?

Design: Prospective observational study.

Participants: Thirty-five patients in the intensive care unit at a tertiary teaching hospital.

Outcome Measures: The following measures were recorded daily: Riker Sedation-Agitation Scale, Richmond Agitation-Sedation Scale, Visual Analogue pain scale, Confusion Assessment Method along with demographic and clinical data including sedation administration and patient ability to engage in physical activity.

Results: The cohort was 60% male with a median (IQR) age of 64 (53 to 73). The median (IQR) Riker was 3 (1 to 4); Richmond score -1 (-4.5 to 0) and pain score was 4 (3 to 6). Patients were sedated to a level that would preclude physical activity 42.4% of the time (defined by Riker score 1 to 2) and too agitated for physical activity 3.4% of the time (as defined by Riker score 6 to 7). On the occasions the Confusion Assessment Method could be performed, the incidence of delirium was 54.3%.

Conclusion: The results of this study suggest that patients were generally sedated which precluded them from participation in physical activity a significant proportion of the time. Despite burgeoning evidence supporting early rehabilitation within intensive care, patient participation may be affected by delirium, level of consciousness and sedation management. Optimising sedation management and maintaining people in an engaged state may improve physical outcomes of intensive care patients.

Key Practice Points:
• Participation in early mobilisation and rehabilitation activities is dependent on patient engagement.
• Delirium, level of consciousness and sedation management may play a significant role in patient engagement.
• Future studies should consider how to achieve titration of sedation and maintenance of patient engagement for the benefit of patient physical function outcomes.

HOW DO GRADUANDS SELF-REPORT THEIR PREPAREDNESS FOR PHYSIOTHERAPY PRACTICE?

Skinner K, Hyde S
Charles Sturt University Orange

Question: How do graduands self-report their preparedness for physiotherapy practice?

Design: Survey of graduands at time of their final undergraduate assessment.

Participants: Prospective physiotherapy graduands from the final intake completing a traditional physiotherapy program at a regional university.

Outcome Measures: Self-reported level of preparedness for physiotherapy practice in eight key domains of practice: interpersonal skills; confidence and coping; collaboration; patient management and practical skills; understanding science; prevention; holistic care; and self-directed learning.

Results: 37% of potential graduands participated. They felt adequately prepared for physiotherapy practice in seven of the eight domains, with only neutral feelings about preparedness in the interpersonal skills domain.

Conclusion: Graduands from this traditional physiotherapy program felt adequately prepared for physiotherapy practice in the majority of domains. They were less confident in the domain of interpersonal skills. The physiotherapy program is transitioning to a problem-based learning (PBL) program. Previous research in medical programs has shown greater preparedness in interpersonal skills for students completing a PBL program than a traditional program. Further survey of future graduands will help to establish whether the new physiotherapy PBL program continues to provide adequate preparedness, and specifically, shows any improvement in the domain of interpersonal skills.

Key Practice Points:
• Graduands from this traditional physiotherapy program generally feel adequately prepared for practice.
• The domain with less than adequate preparedness was interpersonal skills. This may be addressed in the new program.
• Graduands’ development of interpersonal skills may need formal support during their transition into work.

THE PAINHEALTH INITIATIVE: DEVELOPMENT, EVALUATION AND IMPLEMENTATION OF AN EVIDENCE-BASED INTERACTIVE WEB PLATFORM FOR AUSTRALIAN CONSUMERS WITH MUSCULOSKELETAL PAIN

Slater H1,2,3, Davies SJ1,2, Milne G2, Kelso J2, Briggs AM4,5
1School of Physiotherapy, Curtin University, Perth
2Curtin Health Innovation Research Institute, Curtin University, Perth
3Pain Medicine Unit, Fremantle Hospital and Health Service, Perth
4System Policy and Planning, Department of Health (WA), Perth
5Arthritis and Osteoporosis Victoria, Melbourne
6Department of Computer Science and Engineering, University of Western Australia, Perth

Question: Is it possible to develop, evaluate and implement a web platform which facilitates access to evidence-informed knowledge and skills for consumers with musculoskeletal pain?


Participants: External reference group (ERG): health consumers (n=8); interdisciplinary pain management clinicians/researchers (n=10); health policy officers (n=3).

Intervention: The ERG provided evaluation data (2 phases).

Outcome Measures: Evaluation data included responses to best practice questions for assessing the quality of web sites (11 categories; rating 0-100; 100 = best possible outcome) and responses to standardised questions (8 categories). Responses were assessed using a Likert scale (1-5: strongly disagree (1) to strongly agree (5)).

Results: Three prototypes with different user interfaces were developed and trialled and based on evaluation outcomes a single prototype selected. Evidence-based content was developed and assessed for accuracy by the ERG. The final web platform was rated favourably mean 69/100 (N=18; 11 categories) and responses to the majority of standardised questions were also favourable (Likert mean 4.0-5.0). Preliminary monitoring data (first 2 weeks post-launch) indicate 302, 942 hits with 5,726 visitors (45% from Australia).

Conclusion: Translation of evidence-informed practice into a consumer-focused, accessible and sustainable web-based resource for all Australian consumers with musculoskeletal pain is possible.

Key Practice Points:
• Consumers require combined integrated knowledge and skills to help better co-manage their musculoskeletal pain
• Consumers with persistent musculoskeletal pain require a ‘whole’ person approach to pain management
• Novel communications technologies such as smart devices, iPads and android provide a useful platform to facilitate access to best evidence practice for consumers.
A PHYSIOTHERAPY PROGRAM WITH SPECIFIC MANUAL THERAPY VERSUS ADVICE FOR PATIENTS WITH SUBACUTE BACK PAIN: A RANDOMISED CONTROLLED TRIAL

Slater SL1, Ford JJ1, Taylor NP1, Surkitt LD1, Richards MC1, Chan AYP1, Hahne AJ1

1Department of Physiotherapy, La Trobe University, Melbourne

Question: Is a physiotherapy program with specific manual therapy more effective than advice at reducing pain and increasing activity in a subgroup of patients with subacute low back pain considered to be of lumbar zygapophysial joint origin?

Design: Multicenter, parallel group randomised controlled trial.

Participants: Forty six individuals with chronic whiplash ongoing follow up until return of pain.

Outcome Measures: The primary outcome measures included pain (0-10 numerical pain rating scale) and activity limitation (Oswestry Disability Index).

Results: Sixty-four participants enrolled in the trial (38 women, 26 men) with a mean (SD) age of 45(12) years and mean duration of back pain of 16(6) weeks. Linear mixed model analyses showed significant between-group differences on back pain intensity at 5, 10 and 26-week follow-up in favour of the physiotherapy program with specific manual therapy (26 week: 1.4, 95% CI 0.3 to 2.5; p = 0.01). Participants receiving this intervention also showed significant between-group differences in activity limitation at 26 weeks (8.2, 95% CI 3.1 to 13.2, p<0.002), that was maintained at 52 weeks (8.1, 95% CI 3.0 to 13.2; p = 0.002).

Conclusion: A physiotherapy program with specific manual therapy was more effective at reducing pain and increasing activity compared to advice at 26 and 52 weeks.

Key Practice Points:
• Successful cervical radiofrequency neurotomy in individuals with chronic whiplash symptoms resulted in a significant improvement in all physical and psychological features.
• Within one month of return of pain, most physical and psychological features regressed.
• Further research is needed to understand the underlying mechanisms responsible for these changes.

CERVICAL FACET JOINT NOCICEPTION MODULATES PHYSICAL AND PSYCHOLOGICAL FEATURES OF CHRONIC WHIPLASH SYMPTOMS

Smith A1, Jull G1, Schneider G1, Frizzell B2, Hooper A2, Sterling M2

1CCRE: Spinal Injury, Pain and Health, Division of Physiotherapy, University of Otago
2University of Calgary

Question: Is cervical facet joint nociception modulate physical and psychological features of chronic whiplash symptoms?

Design: A prospective observational pre/post test design with ongoing follow up until return of pain.

Participants: Forty six individuals with chronic whiplash symptoms who successfully responded to cervical radiofrequency neurotomy.

Intervention: Cervical radiofrequency neurotomy with measures collected at time-point one (immediately prior to neurotomy), time-point two (one to three months post-neurotomy) and time-point three (one month following return of pain).

Outcome Measures: Pain, disability, quantitative sensory testing (pressure and thermal pain thresholds) and nociceptive flexor reflex measures were collected. Psychological questionnaires included the General Health Questionnaire: Pain Catastrophization Scale and the total symptom score of the Post Traumatic Stress Diagnostic Scale.

Results: Cervical radiofrequency neurotomy resulted in improvements in pain and disability (p < 0.001), and reduced hyperalgesia to pressure (all p < 0.005) and thermal stimuli (p < 0.001) in the post-three month period. Nociceptive flexor threshold improved significantly (p = 0.001). There was a significant reduction in psychological distress (p < 0.001), pain catastrophization (p < 0.001), and post-traumatic stress symptom severity (p = 0.009) measures. Within 1-month of pain return (mean time = 12 months), all measures (apart from pressure pain thresholds, all p > 0.18; and posttraumatic stress symptoms, p = 0.10), regressed significantly (p < 0.001).

Conclusion: Modulation of peripheral nociception influenced most measures of physical and psychological impairments in individuals with chronic whiplash symptoms. Ethics ID: E-22082 (University of Calgary Conjoint Health Research Ethics Board)

Key Practice Points:
• Successful cervical radiofrequency neurotomy in individuals with chronic whiplash symptoms resulted in a significant improvement in all physical and psychological features.
• Within one month of return of pain, most physical and psychological features regressed.
• Further research is needed to understand the underlying mechanisms responsible for these changes.

NEUROMOTOR CONTROL OF THE GLUTEAL MUSCLES DURING WALKING AND RUNNING IS RELATED TO LOWER LIMB INJURY IN ELITE AFL PLAYERS

Smith MM1, Bonacci J1, Stanton W1, Hides JA1

1School of Physiotherapy, Australian Catholic University, Brisbane
2School of Exercise and Nutrition Sciences, Deakin University Australia, Geelong

Question: Is neuromotor control of the gluteal muscles during walking and running related to lower limb injury in elite AFL players?

Design: Prospective observational study.

Participants: Twenty-six individuals from a professional AFL club.

Outcome Measures: Bilateral electromyographic recordings of gluteus medius and gluteus maximus during walking and running were measured at the beginning of the season and normalised to maximum voluntary contraction. History of lower limb injury during the pre-season (prior to testing) and incidence of lower limb injury during the season (after testing) were determined from club injury reports.

Results: Sixteen individuals incurred a lower limb injury during the season. Individuals who incurred a lower limb injury during the season exhibited greater activation of gluteus medius at baseline testing (p = 0.03; mean difference change = 11.6%, running 21.7%; effect size 0.7, 1.0 respectively). Gluteus medius activation was not associated with history of lower limb injury in the pre-season (p = 0.31). In contrast, gluteus maximus activation was not associated with incidence of lower limb injury during the season (p = 0.59). However, reduced gluteus maximus activation was associated with history of lower limb injury during the pre-season (p = 0.03; mean difference change = 10.4%, running 23.2%; effect size 1.4, 0.3 respectively).

Conclusion: Results suggest that a lower limb injury may affect activation levels of gluteus maximus during walking and running. In contrast, greater activation of gluteus medius during walking and running is related to lower limb injury incidence in elite AFL players.

Key Practice Points:
• Gluteus maximus activation is reduced in individuals with a history of lower limb injury.
• Lower limb injury incidence during the season was related to greater pre-injury gluteus medius activation.
• Neuromotor control of gluteal muscles should be considered in the prevention and management of lower limb injuries in AFL players.
ASSESSING UPPER LIMB TO LOWER LIMB MUSCLE STRENGTH RATIOS IN ROWERS, USING HAND-HELD ISOMETRIC DYNAMOMETRY

Smyth EA\(^1\), Witchalls J\(^1\), Drew M\(^2\)

\(^1\)The Canberra Hospital Emergency Department, Canberra
\(^2\)The Australian Institute of Sport, Canberra

Questions: Can isometric strength tests be used for similar purposes to isokinetic strength tests in assessing muscle strength imbalances in rowers?

Design: Methodological study

Participants: Eight elite adult national rowers.

Outcome Measures: Strength as demonstrated by isokinetic (Biodex system II), compared with isometric (PowerTrack hand held dynamometer) testing. Muscle groups tested were the left and right knee extensors, knee flexors and elbow flexors. The two different methods of measurement were compared by calculating the Pearson’s product-moment correlation coefficient (r) for each muscle group and the knee extensor to elbow flexor strength ratio (KE/EF ratio).

Results: Comparison of absolute scores for the left and right knee extensors and elbow flexors showed significant statistical correlation between both methods of measurement (r = 0.63-0.92, p < 0.05-0.01). However the knee flexors did not correlate (r = 0.54-0.55, p = 0.08-0.08). When testing KE/EF ratios for the left and right legs Pearson’s r values were (r = 0.810, p = 0.014) and (r = 0.881, p = 0.046) respectively.

Conclusion: Previous research has shown that higher elbow flexor strength relative to knee extensor strength is significantly correlated to risk of incurring a rib stress fracture in elite rowers. This study has shown that the hand-held dynamometer can be used to assess isometric strength in rowers, giving good compatibility with the “gold standard” for strength testing when assessing the knee extensor and elbow flexor muscle groups. Further research is needed to assess the relative value of isometric vs isokinetic testing in injury surveillance and performance testing.

Ethics approval: This study was approved by the Australian Institute of Sport Ethics Committee (Approval Number 20130208).

Key Practice Points:
- Higher elbow flexor strength relative to knee extensor strength increases the risk of incurring a rib stress fracture in elite rowers
- Hand-held dynamometry measurements of this ratio correlate with isokinetic measurements
- Hand-held dynamometry is an easy, simple and reliable method of testing the knee extensor to elbow flexor strength ratio in the clinic without the need for an isokinetic machine.

INVESTIGATION OF THE EFFECTIVE DOSE OF MOBILISATION FOR PATIENTS WITH CHRONIC NON-SPECIFIC NECK PAIN (THE DOSE STUDY)

Snoggrass SJ\(^1\), Rivett DA\(^1\), Sterling M\(^2\), Vicenzino B\(^3\)

\(^1\)Discipline of Physiotherapy, School of Health Sciences, The University of Newcastle, Newcastle
\(^2\)Centre of National Research on Disability and Rehabilitation Medicine (CONROD), University of Queensland, Herston
\(^3\)University of Queensland, Center of Clinical Research Excellence in Spinal Pain, Injury & Health, Brisbane

Question: Does the magnitude of force applied during posterior-to-anterior (PA) passive joint mobilisation affect immediate and short-term treatment outcomes in patients with chronic non-specific neck pain?

Design: Randomised controlled trial.

Participants: Sixty-four patients with non-specific neck pain ≥ 3 months duration.

Intervention: Participants were randomised to receive 3 sets of 30 seconds of PA mobilisation with 30 or 90 N applied force, or a placebo of detuned laser on the spinous process at their painful spinal level.

Outcome Measures: Pressure pain threshold (PPT), pain (100 mm visual analogue scale), cervical range of motion (ROM) and instrumented cervical spine stiffness at the painful spinal level as a percentage of C7 stiffness. Each was measured immediately after treatment and at follow-up 4.0 mean days (SD 1.8) later.

Results: The 90 N mobilization group reported less pain than the 30 N group (mean group difference 11.3 mm, 95% CI: 0.1 to 22.6, p = 0.048) and lower stiffness than the placebo group (17.5%, 95% CI: 4.2 to 30.9, p = 0.006) at follow-up, but these differences were not present immediately after treatment. There were no significant between-group differences in PPT or ROM immediately after treatment or at follow-up.

Conclusion: A threshold dose of applied mobilisation force appears necessary for optimally reducing pain and stiffness in patients with chronic neck pain. Delayed rather than immediate changes observed in spinal stiffness suggest the effects of mobilisation are not directly mechanical. Acknowledgement: Physiotherapy Research Foundation, Australian Physiotherapy Association.

Key Practice Points:
- Specific levels of mobilisation force appear necessary for optimally reducing pain in patients with chronic neck pain
- Changes in pain and spinal stiffness following mobilisation appear to be delayed rather than immediate
- Delayed changes in pain and spinal stiffness suggest the mechanism of mobilisation is unlikely to be directly mechanical

USING TECHNOLOGY TO ENHANCE CLINICAL SUPERVISION: THE ELECTRONICALLY-FAcILITATED FEEDBACK INITIATIVE (EFFI)

Snoggrass SJ\(^1\), Hall K\(^2\), Rivett DA\(^1\), Ashby SE\(^1\), Johnston CL\(^1\), Nguyen K\(^1\), Russell T\(^1\)

\(^1\)School of Health Sciences, The University of Newcastle, Newcastle
\(^2\)Hunter New England Area Health Service, Newcastle

Question: What are the perceptions of students and clinical educators regarding the use of electronic feedback for student learning in clinical placement settings?

Design: Cross sectional observational study using surveys, interviews and focus groups.

Participants: Students (n = 19) and clinical educators (n = 9) who participated in a clinical placement where iPads and specialised software were used to provide electronic student feedback.

Outcome Measures: Participants completed a written survey comprising questions relating to the frequency of use, benefits and challenges of using electronic feedback during placements. Semi-structured interviews and focus groups were also held with participating clinical educators and students to gain further insight into their perceptions regarding the use of iPads for delivering formative performance feedback.

Results: Thirteen surveys (68%) were returned by students and nine (100%) by educators. Eleven students and nine educators participated in focus groups or interviews. Most students found the electronically-delivered feedback easy to access (92%) and reported in focus groups it was useful for revision and reflection, but they also wanted more specific feedback. Clinical educators reported using the system encouraged them to provide more feedback than usual, and that recorded electronic feedback provided evidence of student performance that was useful for subsequent formal assessments. Technological barriers restricted optimal use in the clinical setting and there were difficulties using it in acute (i.e., sterile) settings.

Conclusion: Using electronic feedback is feasible in some clinical placement settings. Students and educators report electronically-provided feedback is useful for student self-reflection and documentary evidence for formal assessments.

Key Practice Points:
- Using a mobile device (e.g., iPad) to record student feedback in clinical settings is generally feasible
- Electronic feedback provides a record of student progress that can be used for student review and deeper learning
- Clinical educators can use electronic feedback provided during placements for documentary evidence for later formal assessments

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Criteria for exclusion were: recent fall (within three months) or history of falls that determined the health-related quality of life of an individual with Parkinson’s disease. Understanding how these factors examined included age, sex, disease severity, disease duration, co-morbidities and self-reported history of falls. Impairments associated with Parkinson’s and self-care limitations were assessed using the Unified Parkinson’s Disease Rating Scale. Mobility limitations were quantified using the Timed “Up and Go” Test.

Results: Two competing models of health-related quality of life were examined in this study and both models had a reasonable fit were developed. The strongest predictor of mobility limitation was self-care limitations (b = -0.31; p < 0.05). The second strongest predictor of fall-related quality of life was self-reported history of falls (b = -0.21; p < 0.05). The model with the strongest predictors was selected for analysis.

Conclusion: This study illustrated that it was the complex interaction between activity limitations, impairments in motor and non-motor function and personal factors such as self-reported history of falls that determined the health-related quality of life of an individual with Parkinson’s disease. Understanding how these factors are inter-related may enable clinicians to optimise therapy outcomes.

Key Practice Points:
• Health-related quality of life in people with Parkinson’s is associated with self-care limitations, mobility limitations and self-reported history of falls.
• Path analysis provides a greater clarity regarding the determinants of life quality.
• Further prospective studies are needed to validate the findings of this study.

PREDICTORS OF HEALTH-RELATED QUALITY OF LIFE IN PEOPLE WITH PARKINSON’S DISEASE

Soh SE, McGinley JL, Watts JI, Menz H, Murphy AT, Iansik R, Huxham F, Morris ME

1Department of Physiotherapy, Alfred Health, Melbourne
2Department of Physiotherapy, School of Primary Health Care, Monash University, Melbourne
3Physiotherapy Department, Melbourne School of Health Sciences, The University of Melbourne, Melbourne
4Centre for Health Economics, Monash University, Melbourne
5Lower Extremity and Gait Studies Program, Faculty of Health Sciences, La Trobe University, Melbourne
6Clinical Research Centre for Movement Disorders and Gait, Monash Health, Melbourne
7School of Allied Health, Faculty of Health Sciences, La Trobe University, Melbourne

Question: What are the impairments, activity limitations and personal factors that predict health-related quality of life in people with Parkinson’s disease?

Design: Analytic observational study.

Participants: Two hundred and ten individuals with idiopathic Parkinson’s disease who completed the baseline assessment of an existing trial.

Outcome Measures: The Parkinson’s Disease Questionnaire-39 was used to quantify health-related quality of life. Personal factors examined included age, sex, disease severity, disease duration, co-morbidities and self-reported history of falls. Impairments associated with Parkinson’s and self-care limitations were assessed using the Unified Parkinson’s Disease Rating Scale. Mobility limitations were quantified using the Timed “Up and Go” Test.

Results: Two competing models of health-related quality of life were examined in this study and both models had a reasonable fit were developed. The strongest predictor of mobility limitation was self-care limitations (b = -0.31; p < 0.05). The second strongest predictor of fall-related quality of life was self-reported history of falls (b = -0.21; p < 0.05). The model with the strongest predictors was selected for analysis.

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• Health-related quality of life in people with Parkinson’s is associated with self-care limitations, mobility limitations and self-reported history of falls.
• Path analysis provides a greater clarity regarding the determinants of life quality.
• Further prospective studies are needed to validate the findings of this study.

STUDENT COMMUNITY SERVICE-LEARNING EXPERIENCE THROUGH NEEDS ANALYSIS AND HEALTH PROMOTION PROJECT IMPLEMENTATION

Sosnovtseva NS, Duong LH, Tang N, Vicariotto E1

1University of Melbourne Physiotherapy, 3rd Year Doctor of Physiotherapy Students

Question: How can Needs Assessment and Social Ecological Model of Health be utilized by physiotherapy students to create a health promotion project in a specialist secondary school for students with intellectual disability?

Design: Needs analysis of normative, felt, expressed and comparative needs was conducted, followed by consultation with community leaders to design and implement a health promotion project.

Participants: Montague Continuing Education Centre.

Methods: Understanding of the determinants of health helped create methods for needs assessment. Survey of literature was conducted and needs were measured using questionnaires with students with intellectual disability, teacher focus groups, and parent questionnaires. The Annual Family Luncheon healthy eating promotion project was chosen to address the main need of healthy diet and through analysis of factors that influence well-being of community members using the Social Ecological Model, as well as collaboration with community leaders. Families were invited to participate in the luncheon, and a MasterChef style cooking class for the students was judged by a former MasterChef contestant. The recommendations that an expert figure and family members of students be involved to positively influence students’ eating habits were made by the community, increasing the community members’ ownership of the project. The sustainability plan included implementation and budget plans, as well as other programs that can be implemented by the school to continue to address the needs of the community.
Incontinence, body image, pelvic floor dysfunction and lumbo-pelvic pain in post-natal women with diastases of the rectus abdominus

Southby AK1, Dynon M1, Haines TP2, Rogers K1, Nicholls K1, Jacob A1, MacRae C1, Skinner EH1,2,3
1Monash Health, Melbourne
2Allied Health Research Unit, Monash University, Melbourne
3Western Health, Melbourne

Questions: Does having a clinically important diastasis of the rectus abdominus post-natally affect continence, body image, pelvic floor dysfunction and lumbo-pelvic pain?

Design: Prospective observational study.

Participants: 40 post-natal women with and 60 post-natal women without a clinically important diastasis of the rectus abdominus (six month post-natal follow-up), and 63 women who had never been pregnant (cross-sectional survey).

Outcome Measures: Incontinence (International Consultation on Incontinence Modular Questionnaire); body image (Body Image Disturbance Questionnaire, Multidimensional Body-Self Relations Questionnaire); pelvic pain and dysfunction (Visual Analogue Scale; Pelvic Floor Distress Inventory Short-Form 20); back pain (Roland Morris Questionnaire).

Results: Both diastasis (important and unimportant) groups reported incontinence more than the control group (p = 0.003 and p = 0.03 respectively) however no differences were observed in general body image disturbance (p = 0.05). Women with a clinically unimportant diastasis reported increased pelvic floor dysfunction (p < 0.001) and pelvic pain (p = 0.006) compared to the control group. Women with a clinically important diastasis reported worse mid-torso body image than the control group (p = 0.002). There were no significant differences between groups in back pain.

Conclusion: This longitudinal study demonstrated that women with a clinically important diastasis of the rectus abdominus report only worse body image than women with a clinically unimportant diastasis. The presence of pelvic pain and dysfunction in the clinically unimportant diastasis group suggests that current definitions of the clinical importance of diastasis size need to be reviewed. The presence of a diastasis did not affect lumbar pain.

Key Practice Points:
• Clinical problems may be missed in women not currently considered to have a clinically important diastasis.
• Current definitions of diastasis clinical importance may need to be reviewed.
• Post-natal physiotherapy focuses on abdominal muscle retraining however back pain is not affected by diastasis size; continence management could be emphasised instead.

Conclusion: Use of Needs Assessment, Social Ecological Model, and consultation with community leaders led to a Health Promotion Project that was specialized to the community.

Key Practice Points:
• Use Needs Assessment to find strengths and weaknesses of health-related behaviour within the community.
• Use Social Ecological Model to help organize and address multidimensional factors that contribute to health within a community.
• Collaborate with the community to create a specialized health promotion project.

Four years after the completion of a maintenance exercise program: have quality of life and exercise capacity been maintained?

Spencer LM1, McKeough ZJ1, Alison JA2,3
1Physiotherapy Department, Royal Prince Alfred Hospital Sydney
2Faculty of Health Sciences, University of Sydney
3Department Respiratory Medicine, Royal Prince Alfred Hospital Sydney

Question: To determine if quality of life and exercise capacity had been maintained four years after the completion of a RCT that consisted of a 12-month maintenance exercise program (MEP) that followed pulmonary rehabilitation (PR).

Design: Four year observational study.

Participants: Participants had COPD (FEV1/FVC < 70%; FEV1 % pred < 80%); had completed 8-weeks PR and a 12-month MEP.

Intervention: At the completion of the 12-month MEP participants had maintained exercise capacity and quality of life and were then instructed to continue with unsupervised exercise without further follow-up. Four years later participants were reassessed.

Outcome Measures: Spirometry, six-minute walk test (6MWT), St George's Respiratory Questionnaire (SGRQ), hospital admissions (HA) and length of stay (LOS).

Results: Thirty-seven (77%) of the 48 who completed the 12-month MEP were reassessed at four years [mean (SD): age 70 (8); males 22; BMI 26 (6); smokers 14%]. Results [mean Δ (95%CI)] compared to the end of the MEP showed that SGRQ [2.5 (-4 to -9), p=0.43], HA [0.25 admissions (-0.1 to 0.5)] and LOS [0.06 days (-2.4 to 2.4)] were maintained, but not distance walked during the 6MWT [-8 (-25 to -12) p=0.001] or FEV1,% pred [8 (-3.4 to -12), p<0.001].

Conclusion: Four years following pulmonary rehabilitation plus a 12-month maintenance exercise program, people with COPD had maintained quality of life, hospital admissions and length of stay, but showed a significant decline in exercise capacity.

Neurobehavioural evaluation of the preterm and term infant

Spittle AJ1,2,3
1The Murdoch Childrens Research Institute, Melbourne
2The University of Melbourne, Melbourne
3The Royal Women’s Hospital, Melbourne

Neurobehavioural examinations of babies, both term and preterm, have been used in neonatology for many decades. These examinations remain an important part of clinical practice, despite advanced in technology and the use of carnial ultrasound and magnetic reasonance imaging. Neurobehavioural examinations help to increase our understanding of an infant’s behavior, including their strengths and vulnerabilities, thus enabling us to adjust our care and parent education accordingly. These examinations also assist us to identify those most at risk of developmental disabilities, enabling further assessment and intervention to be considered as early as possible. Whilst it remains a challenge to try and quantify neonatal neurobehavior, there are numerous tools available that can greatly assist us. This workshop will review several assessment tools that can be used with both term and preterm infants. Unfortunately there is no single assessment tool that fulfills all the needs of different populations and age ranges. Therefore, the clinician or researcher needs to choose the appropriate assessment depending on matters such as the infant’s gestation, the assessment’s goal and training requirements. Further research is needed to develop neurobehavioural assessment tools, particularly for extremely preterm infants, which are easily accessible in the clinical setting and can be used from birth.
FEEDBACK RECEIVED WHilst PRACTICING EVERYDAY ACTIVITIES DURING REHABILITATION AFTER STROKE: AN OBSERVATIONAL STUDY

Stanton R1, Ada L1, Dean C1, Preston E1
1School of Physiotherapy, Faculty of Health Sciences, University of Sydney

Question: What is the quantity, frequency, mode and content of feedback received by patients while practicing activities during stroke rehabilitation? Are there differences when a patient’s therapist is present compared with when the patient is practicing alone?

Design: A cross-sectional observational study of the feedback received by people who have had a stroke during rehabilitation was conducted. Forty unique patient:therapist dyads were observed during 30 minutes of actual practice of everyday activities.

Participants: Patients in stroke rehabilitation in Australia working with physiotherapists.

Outcome Measures: Data was collected via behavioural mapping where the quantity, frequency, mode and content of feedback was recorded during each minute of practice.

Results: Patients received ≥ one occasion of feedback/min 68% of the time they were practicing activities. When the therapist was not present patients received ≥ one occasion of feedback/min 37% of the time. Whilst the quantity of specific and motivational feedback was equivalent, the frequency (rate) of motivational feedback was more than four times greater at 1.32 (SD 0.6) occasions/min. Biofeedback was only used for a third of total practice time.

Conclusion: Given the importance of specific feedback for learning, therapists should replace motivational feedback with specific feedback to enhance future practice for the patient. If a therapist leaves a patient to practice alone they should provide another source of feedback. Biofeedback should be used more widely, with or without presence of the therapist.

Key Practice Points:
- Therapists should replace motivational feedback with specific feedback in stroke rehabilitation.
- When leaving a patient to practice alone, a source of feedback (e.g. biofeedback), should be provided.
- Biofeedback should be used more widely.

CAN TARGETING BODY PERCEPTION REDUCE PAIN? THE EFFECT OF MULTISENSORY ILLUSIONS IN PAINFUL KNEE OSTEOARTHRITIS

Stanton TR1,2, Gilpin H1, Moseley GL1,2, Newport R1
1The Sansom Institute for Health Research, The University of South Australia, Adelaide
2Neuroscience Research Australia, Randwick

Question: Do multisensory illusions reduce osteoarthritic knee pain?

Design: Randomised, repeated measures experiment.

Participants: Three people (all female) with painful knee osteoarthritis. Recruitment is ongoing (Aim: 20 participants).

Intervention: A novel machine which alters real-time video was used to apply a visual illusion that the knee was being stretched (visually elongated) or shrunk (visually shortened). Transient traction/pressure to the lower leg was concurrently applied, resulting in a sensation that the leg was actually stretching/shrinking. Participants received illusory stretch and shrink in a randomised order. Illusory stretch/shrink was applied in increments (ie, 25% of total possible stretch, 50%, 75%, and 100%).

Outcome Measures: Current pain was measured using a 101-point numerical rating scale. Pain ratings were taken pre-, during-, and post-illusion.

Results: All three participants had a 50% reduction in pain ratings (from pre-illusion to during-illusion). For two participants, pain relief occurred only during illusory stretch (from 20 to 10/100 at 50% stretch and from 14 to 5/100 at 100% stretch, respectively). The third participant had pain relief during illusory shrink (67 to 33/100) and pain increased with illusory stretch (48 to 57/100). Post-illusion pain scores returned to baseline levels in two of three participants; the participant benefitting from illusory shrink maintained reduced pain post-illusion (33/100).

Conclusion: Preliminary findings suggest that multisensory illusions that alter the appearance of the knee reduce pain. That their effect is specific to (and within) each individual decreases the possibility that pain reduction is due to distraction. The final results involving full recruitment will be presented.

Key Practice Points:
- That multisensory illusions reduce pain in knee osteoarthritis raises the possibility that the brain contributes to the experienced pain
- Multisensory illusions may be a useful adjunct to existing conservative therapies for osteoarthritis, although formal testing is needed.
- The presence of individualised responses to illusory resizing suggests that a ‘one size fits all’ approach will likely be unsuccessful.

PRIMARY MOTOR CORTEX FUNCTION IN COMPLEX REGIONAL PAIN SYNDROME: A SYSTEMATIC REVIEW & META-ANALYSIS

Di Pietro F1,2, McAuley H1, Pakintry L1,2, Lotze M1, Wand BM1, Moseley GL1,2, Stanton TR1,5
1Neuroscience Research Australia, Randwick
2Prince of Wales Clinical School, University of New South Wales, Sydney
3Institute for Diagnostic Radiology and Neuroradiology, University of Greifswald, Greifswald, Germany
4School of Physiotherapy, University of Notre Dame Australia, Fremantle
5The Sansom Institute for Health Research, University of South Australia, Adelaide

Question: Is complex regional pain syndrome (CRPS) associated with dysfunction of the primary motor cortex (M1)?

Design: Systematic review and meta-analysis of case-control studies.

Participants: Adults diagnosed with CRPS and healthy controls.

Intervention: Neuroimaging of M1 including: functional magnetic resonance imaging (fMRI), transcranial magnetic stimulation, electroencephalography, magnetoencephalography, or positron emission tomography (PET).

Outcomes: Cortical excitability/inhibition, spatial representation, reactivity, and glucose metabolism in M1. Pooled data presented as standardised mean differences (SMD).

Results: Eighteen studies (14 unique datasets) were included. Risk of bias across studies was high, mainly from missing data and unblinded outcome assessment. There was no difference in M1 excitability when comparing hemispheres in CRPS (-1.69 [95%CI -3.43 to 0.05]) or comparing CRPS with healthy controls (-0.75 [95%CI -1.54 to 0.05]) expect in upper limb CRPS, where limited evidence of bilateral motor cortex disinhibition was found: 0.89 [95%CI 0.38 to 1.40]. There was no difference in spatial representation of the CRPS-affected hand in M1, either between hemispheres (-0.53 [95%CI -1.42 to 0.36]), or between groups (0.39 [95%CI -0.23 to 1.00]). The fMRI studies of spatial representation could not be pooled, but found conflicting results. Conflicting results also occurred for M1 excitability (CRPS versus healthy controls). One PET study showed reduced glucose metabolism in CRPS of the contralateral hemisphere.

Conclusion: While no definitive conclusions can be drawn regarding M1 spatial representation, reactivity or glucose metabolism, there is limited evidence for bilateral M1 disinhibition in CRPS of the upper-limb. This is tempered by the high risk of bias of included studies.

Key Practice Points:
- Evidence of bilateral disinhibition of the motor cortex (although limited) may be a plausible reason for movement dysfunction in CRPS.
- It is unknown if people with lower limb CRPS may differ from people with upper limb CRPS in important ways; very few studies evaluate lower limb CRPS.
- This review helps us to understand the evidence for/against mechanisms underpinning some of the treatments for CRPS (such as graded motor imagery).
USE OF FUNCTIONAL ELECTRICAL STIMULATION TO IMPROVE AMBULATORY FUNCTION IN DOGS WITH SPINAL INJURY

Steinman LJ
Capital Animal Physiotherapy, Canberra

**Question:** Is functional electrical stimulation useful to improve ambulatory status in dogs with spinal injury?

**Design:** Clinical review of dogs presenting over a two-year period from specialist vet referral.

**Participants:** 20 non-ambulatory dogs who underwent hemilaminectomy for spinal decompression. A further eight non-surgical paralysed dogs (five with fibrocartilaginous emboli and three with intervertebral disc disease) were also included. The canine spinal patient is no exception to the benefits of functional electrical stimulation, which evidence suggests can improve ambulatory function, alleviate pain, spasticity as well as restore standing and walking in patients with spinal cord injury. Following spinal surgery, most owners desire to improve their dog’s ability to walk, equating this function to quality of life.

**Intervention:** Physiotherapy including manual therapy, proprioceptive, strengthening & balance exercises as well as functional electrical stimulation, was commenced at two weeks post-op following suture removal and carried out weekly. Directed daily home use of a functional electrical stimulation unit was also implemented.

**Outcome Measures:**
- **Dogs:** were assessed for improvement in their deep pain response, dynamic stability to external perturbations, tail wag and ability to walk.
- **Results:** 18 of the 20 post-spinal dogs reviewed regained ambulatory function; seven of the eight non-surgical dogs also improving ambulation after functional electrical stimulation was included in their physiotherapy management.

**Conclusion:** Functional electrical stimulation was beneficial as an adjunct to animal physiotherapy in dogs with spinal injury to facilitate ambulatory status. Further high quality research is required in this emerging field of practice.

**Key Practice Points:**
- Ability to achieve ambulation in these dogs significantly improves the quality of life for the animal and reduces the load on the carer.
- Implementation of functional electrical stimulation into the treatment regime of spinal injured dogs is indicated as an adjunct to existing physiotherapy
- Further quality research is indicated

DERIVATION AND VALIDATION OF A CLINICAL PREDICTION RULE TO IDENTIFY BOTH CHRONICITY AND FULL RECOVERY FOLLOWING WHIPLASH INJURY

Sterling M, Ritchie C, Hendrikz J, Kenardy J
Centre for National Research on Disability and Rehabilitation Medicine (CONROD), The University of Queensland

**Question:** Can we clinically identify individuals who will fully recover or develop chronic pain and disability following whiplash injury in order to enhance clinical decision making?

**Design:** Inception cohort study with 12 month follow-up.

**Participants:** 262 participants with acute (<3 weeks) whiplash.

**Outcome Measures:** Predictor variables: initial neck disability index (NDI), initial pain (VAS), cold pain threshold, range of neck movement, age, gender, presence of headache and posttraumatic stress symptoms (PDS). Dependent variable: NDI. For the ‘chronic moderate/severe’ pathway, participants were dichotomised as having chronic pain related disability (NDI > 30% at 12 months) or partially/fully recovered (NDI < 30%). For the ‘full recovery’ pathway, participants were dichotomised as fully recovered (NDI < 10% at 12 months) or mild/moderate/severe disability (NDI > 10%).

**Results:** An increased probability of developing chronic moderate/severe disability was predicted in the presence of age (>35 years), initial NDI >40% and hyperarousal symptoms (>6) on PDS (Specificity: 93.8% (95% CI 89 to 96); Sensitivity 43.5% (95% CI 31 to 55); PPV: 71.4%; positive LR: 7.0 (95% CI 3.8 to 12.9). The probability of full recovery was increased in younger individual NDI ≤ 32% (Specificity: 84.5% (95% CI 77 to 90); Sensitivity 45.3% (95% CI 35 to 54); PPV: 71%; positive LR: 2.9 (1.9-4.5). The clinical prediction rule (CPR) was validated in an independent cohort (n = 100).

**Conclusion:** This is the first study to develop and validate a CPR for both recovery and the development of chronic pain and disability following whiplash injury.

**Key Practice Points:**
- It is important for physiotherapists to identify patients with good or poor recovery following whiplash injury
- The CPR is a promising instrument for identifying subgroups of patients to guide early management of whiplash
- Further research is required to establish whether providing targeted treatment to CPR subgroups improves patient outcomes

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TRIAL OF A COMPUTER-BASED PROGRAM THAT PROVIDES LENGTH OF STAY BENCHMARK FIGURES AT A REHABILITATION CENTRE

Roberts K1, Stiller K1, Harling R1, Lynch E1, Forward S1
1Hampstead Rehabilitation Centre, Adelaide
2Royal Adelaide Hospital, Adelaide

**Questions:** Does using a computer-based program that provides real-time length of stay (LOS) benchmark figures identify patients with LOS in excess of benchmark figures? Does it impact on LOS? What are staff perceptions of its usefulness?

**Design:** Prospective study.

**Participants:** One-hundred-and-eight inpatients in a stroke rehabilitation unit (SRU) and 94 inpatients in a brain injury rehabilitation unit (BIRU) were included in the patient component of the study; 13 staff completed a post-trial survey.

**Intervention:** The multidisciplinary rehabilitation did not change from that routinely provided. A computer-based program, consisting of a series of linked excel spreadsheets, was trialled.

**Outcome Measures:** The number of patients with a LOS in excess of benchmark figures, the reasons for delayed discharge, impact of using the computer-based program on LOS were recorded using the computer-based program. A purpose-designed survey was used to assess staff perceptions of the program’s usefulness.

**Results:** LOS in excess of benchmark figures was found for 48 (44%) SRU and 44 (47%) BIRU participants, resulting in a total discharge delay of 6311 days. Reasons for discharge delay were diverse. Using the computer-based program did not consistently decrease LOS compared to data from the previous year. Staff perceptions regarding the usefulness of the computer-based program were mixed.

**Conclusions:** The use of a computer-based program that provided real-time LOS benchmark figures was able to identify patients with LOS beyond benchmark figures but did not consistently decrease LOS and, on the whole, was not favourably received by clinical staff.

**Key Practice Points:**
- Length of stay is an important consideration for healthcare practitioners
- Computer-based programs that compare real-time length of stay to benchmark figures may facilitate timely discharge
- A computer-based program identified patients whose length of stay exceeded benchmark figures, but did not impact on length of stay and, overall, was disliked by clinicians.
EVALUATING PATIENTS’ ATTITUDES TOWARDS BEING ASSESSED AND TREATED BY UNDERGRADUATE PHYSIOTHERAPY STUDENTS IN A REHABILITATION CENTRE

Stiller K1, Sorich M1, Roberts K1
1Royal Adelaide Hospital, Adelaide
2Hamptead Rehabilitation Centre, Adelaide

Questions: What are patients’ attitudes towards being assessed and treated by undergraduate physiotherapy students?

Design: Prospective study.

Participants: Sixty-one inpatients who were being assessed and treated by physiotherapy students at one rehabilitation centre.

Intervention: The multidisciplinary rehabilitation did not change from that routinely provided. The physiotherapy student intervention consisted of an initial assessment followed by individual one-on-one sessions for 30-60 minutes daily, five days a week. All patient assessments and treatments were supervised by a clinical educator.

Outcome measure: A purpose-designed survey was administered on a single occasion during the last week of each participant’s admission or the last week of the students’ treatment period. The survey comprised 25 questions requiring broad categorical responses and four open questions.

Results: Overall, extremely high levels of satisfaction were reported with the services provided by undergraduate physiotherapy students, including the consent process, the amount of supervision provided to the students, the standard of care they provided and personal feelings about being treated by physiotherapy students. Conclusions: These findings suggest that the standard of care provided by undergraduate physiotherapy students to inpatients at the rehabilitation centre, as rated by patients, is high. This research was straightforward to conduct and has identified areas where the service can be further improved.

Key Practice Points:
- Patient satisfaction is an important healthcare outcome.
- Patient satisfaction with assessment/treatments provided by physiotherapy students has to date, not been reported.
- High levels of satisfaction with services provided by physiotherapy students were found in a sample of inpatients at a rehabilitation centre.

INTRODUCTION OF A MULTIDISCIPLINARY KNEE OSTEOARTHRITIS (OA) GROUP PROGRAM IN COMMUNITY THERAPY SERVICES (CTS)

Koh KW1, Stillman M1
1Physiotherapy Department, Broadmeadows Health Service (BHS) – Northern Health, Broadmeadows

Question: Does a multidisciplinary knee OA group program improve clients’ access to conservative care, knowledge in self-managing, functional outcomes and QoL?

Design: Exploratory study of a new service.

Participants: Clients from the CTS BHS waitlist were referred to the knee OA group program after physiotherapy assessment during 2012.

Intervention: The group program ran once a week over 4 weeks and included education and exercise components. Education sessions consisted of information on osteoarthritis, activities of daily, exercise, weight management and supplements. Exercise included tailored strength, balance and flexibility exercises.

Outcome Measures: The primary outcome was waitlist duration and secondary outcomes were clients’ understanding of knee OA self-management, Knee Osteoarthritis Outcome Score (KOOS) and 6-minute walk test (6MWT). Outcomes were measured pre and post completing the program.

Results: Twenty clients joined the program during 2012. Since the implementation of the program the waitlist time decreased from 12 months in 2011 to 4 weeks by the end of 2012. A Wilcoxon signed-rank test showed statistically significant improvements in clients’ understanding of self-management (n=9, p=0.015). There was no significant difference in 6MWT. Only sports/recreation (n=8, p=0.011) and QoL (n=8, p=0.028) in KOOS showed statistical significance. Ethics approval pending.

Conclusion: A multidisciplinary knee OA group program greatly improves clients’ access for conservative management. Results suggest improvements in clients’ understanding to self-manage, as well as QoL and sports/recreation domains of KOOS. Further studies should address the high drop-outs rates, assess long-term effect and compare findings to non-group conservative management services.

Key Practice Points:
- The development of a 4 week multidisciplinary knee OA group program can significantly improve access to conservative care in Community Therapy Services.
- The multidisciplinary knee OA group program significantly improved clients’ understanding to self-manage.
- Completing a knee OA group program significantly improved clients’ concerns on QoL and sports/recreation domains.

FRIEND OR FOE? THE IMPACT OF ELECTRONIC GAMES ON CHILDREN’S PHYSICAL HEALTH

Leon Straker

Question: Does playing electronic games have a positive or negative impact on children’s physical health? Background: The majority of children in affluent communities play electronic games – on dedicated console devices, computers, tablets, smart phones and dedicated hand-held devices. The frequency and duration of exposure is sufficient to warrant concerns about the health impacts.

Results: Studies have reported that the negative effects of electronic game use potentially include acute trauma, overuse injuries, and increased sedentariness. However other studies have reported the potential for positive effects including enhancing motor coordination and physical activity. Further, electronic games differ in the movements required to play the game, in both the amount and quality of movement. Findings from recent laboratory studies comparing the energy and kinematics of different games and from recent intervention trials comparing sedentariness and physical activity and motor coordination will be presented. Clinicians are now attempting to use electronic games in rehabilitation and preventative interventions. Tentative guidelines for wise use of electronic games will be proposed.

Conclusion: Movement is critical to normal development and physiotherapists are experts in movement. Physiotherapists therefore need to understand the movement implications of electronic games and utilise this understanding to help prevent and manage disorders.

Key Practice Points:
- Electronic game playing is often a major part of children’s lives.
- Inappropriate game technology and use may harm children’s health.
- Appropriate game technology can be used to enhance children’s health.

WHAT LURKS BENEATH? THE HIDDEN DANGERS OF OFFICE WORK

Leon Straker

Question: Does the rising exposure to sedentary occupations pose a major public health risk? Background: An increasingly large proportion of the workforce is employed in occupations requiring extensive sitting with limited physical activity. Both excessive sedentary exposure and insufficient moderate-vigorous physical activity have been linked with major health disorders.

Results: Ergonomics and occupational health have traditionally mitigated occupational risks by reducing exposure to physical load. Exercise science has traditionally mitigated lifestyle risks by increasing exposure to physical load. Occupational health has largely focussed on workplace exposures, though workplace preventative health programs addressing non-work health risks are now becoming commonplace. Distinctions between work and non-work are blurring as telework increases, the same physical tools (computers) are used at work and home, and sedentary risk of musculoskeletal, cardiometabolic and other disorders accumulates at work and home. The community burden of dealing with sedentary-related disorders will threaten economic viability and standards of living.
Conclusion: Activity is critical to the maintenance of health and the restoration of health. Physiotherapists are experts in movement and therefore have a clear need to understand the health implications of office work and utilise this understanding to help prevent and manage disorders.

Key Practice Points:
- Sedentary office work is a major part of many people’s lives.
- Work systems need to be designed to enhance, rather than diminish, worker health.
- Workplaces are an attractive opportunity for physiotherapists to promote healthy lifestyles.

THE ASSOCIATION BETWEEN PELVIC FLOOR MUSCLE FUNCTION AND PELVIC GIRDLE PAIN – TWO CASE CONTROL 3D ULTRASOUND STUDIES

Stuge B1, Sætre K1, Hoff Brækken I1
1Department of Orthopaedics, Oslo University Hospital, Oslo, Norway
2Department of Public Health and Primary Health Care, University of Bergen, Norway

Background: There is uncertainty regarding the association between the function of the pelvic floor muscles (PFM) and pelvic girdle pain (PGP), and whether exercises to strengthen the PFM should be recommended for patients with PGP. The active straight leg raise (ASLR) test has been proposed as a clinical test for the assessment of PGP. Little is known about the activation of the PFM during ASLR.

Aims: The main aim was to examine whether there is any difference in PFM function between women with (case) and without (control) clinically diagnosed PGP, during 1) rest and voluntary contraction and 2) during ASLR. Specific aims were to compare automatic contraction to rest and to voluntary contraction, to compare PFM contraction during ASLR with and without contraction.

Design: Cross-sectional study with individual, one-to-one matched cases and controls.

Methods: PFM function was assessed by manometry and reliable and valid three-dimensional ultrasound at rest, during voluntary and automatic contraction. Test-retest data for the levator hiatus area during ASLR showed good repeatability. Images were saved anonymously and analyses were performed offline by one investigator. A special Cox regression model was used to fit a conditional logistic regression procedure for one-to-one matched case-control studies. Forty-nine pairs of women were successfully matched according to age and parity.

Results: The study showed no difference between cases and controls in voluntary PFM function measured by palpation, manometry or ultrasound. The size of the levator hiatus area, together with BMI, was significantly associated with PGP. Women with high anorectal pressure significantly smaller levator hiatus areas and a tendency for higher vaginal resting pressure compared to the control group. Significantly automatic PFM contractions occurred, both in cases and in controls, when ASLR tests were performed. There was a strong positive correlation between voluntary and automatic PFM contractions. Manual compression reduced the automatic PFM contraction during ASLR by 62-66%. There were no significant differences between cases and controls in reduction of levator hiatus or muscle length from rest to automatic contractions during ASLR.

Discussion: A significantly smaller levator hiatus and a tendency for higher vaginal resting pressure might indicate increased activity of the PFM. Hence, no evidence was found to recommend strengthening exercises for the PFM in patients with PGP.

Conclusion: Interestingly, a significantly smaller levator hiatus was found in women with PGP than in controls, at rest, during an automatic contraction with ASLR and during voluntary contraction.

References:
Stuge B, Sætre K, Ingeborg HN. The active straight leg raise in cases with pelvic girdle pain and matched controls. Man Ther. 2013;1:

DEVELOPMENT AND MEASUREMENT PROPERTIES OF THE CONDITION-SPECIFIC PELVIC GIRDLE QUESTIONNAIRE

Stuge B, Garratt A, Jenssen HK, Grotle M
Department of Orthopaedics, Oslo University Hospital, Oslo, Norway

Background: There is a need for an outcome measure that is reliable and valid for patients with pelvic girdle pain (PGP).

Objective: To develop and test a condition-specific measure, the Pelvic Girdle Questionnaire (PGQ) for pregnant and postpartum patients and to examine measurement properties of other instruments commonly used for patients with PGP.

Methods: Item developed followed a literature review, a focus group of patients with clinically verified PGP and consultation with physical therapists. Face and content validity were assessed by classifying the items according to the WHO’s Classification of Functioning and Disability (ICF). Following a pilot study the PGQ was administered to patients with clinically verified PGP, by means of postal questionnaire in two surveys. The first survey included 94 patients (52 pregnant) and the second, 87 patients (43 pregnant). Rasch analysis was used for item reduction and the PGQ was assessed for unidimensionality, item fit, redundancy and differential item functioning. The second survey included the PGQ, Oswestry Disability Index 2.0 (ODI), Disability Rating Index (DRI), Pain Catastrophizing Scale (PCS), and the 8-item version of the SF-36. Test-retest reliability was assessed in both surveys. Internal consistency was assessed by Cronbach’s alpha and test-retest reliability by the Intraclass Correlation Coefficient (ICC), minimal detectable change at individual (MDCind) and group level (MDCGroup). Construct validity based on hypotheses, was assessed by correlation. Discriminant validity was assessed by area under receiver operating curves.

Results: The analysis resulted in a questionnaire with 20 activity and 5 symptom items with a four-point response scale. Items within both these scales showed a good fit to the Rasch model with acceptable internal consistency, satisfactory fit residuals and no disordered threshold. Test-retest reliability showed high ICC estimates of 0.93 (95% CI 0.86, 0.96) for the PGQ activity scale and 0.91 (95% CI 0.84, 0.95) for the PGQ symptom scale, respectively. Cronbach’s alpha ranged from 0.88 to 0.94 and the ICCs from 0.78 to 0.94. The MDCind constituted 7-14% of the total score ranges for the SF-8 items, the ODI and the PGQ-Activity, 18-22% for the DRI, PGQ-Symptom, and PCS, and 25% for the FABQ. Hypotheses were mostly confirmed in the correlations between instruments. PGQ was the only instrument that significantly (p<0.01) discriminated both between pregnant and non-pregnant patients and between pain in all three joints compared to their counterparts.

Conclusions: The PGQ has evidence for reliability and validity for both pregnant and postpartum patients with PGP, is simple to administer and feasible for use in clinical practice. Also the other self-reported instruments showed good measurement properties, however, the PGQ was the only instrument with satisfactory discriminant validity. We recommend the PGQ to evaluate symptoms and disability in patients with PGP both for clinical and research purposes. The instrument’s responsiveness to change is under evaluation.

References:

ATTENTIONAL FOCUS IN MOTOR LEARNING FOR MUSCULOSKELETAL DYSFUNCTION: A SYSTEMATIC REVIEW

Sturmberg C, Marquez J1, Heneghan N2, Snodgrass S3, van Vliet P1
1University of Newcastle
2University of Birmingham, England

Question: Are feedback and instructions inducing an external focus of attention more effective than instructions and feedback inducing an internal focus of attention, in improving function and decreasing pain in patients with musculoskeletal dysfunction?

Design: Systematic review.
Participants: Human participants with any form of musculoskeletal dysfunction.

Intervention: Participants completing an intervention using feedback or instructions inducing an internal focus of attention or external focus of attention were compared to those undergoing the same intervention with a different attentional focus, control, placebo or no focus condition.

Outcome Measures: Function, pain, gait parameters, postural stability, isokinetic strength, muscle tension, patellar alignment and personality changes.

Results: Seven studies with 202 participants were included. Two studies compared an internal with an external focus of attention, two compared internal focus of attention with biofeedback with a different focus condition, and three compared internal focus with biofeedback with a no focus condition. Statistically significant improvements directly attributable to the focus of attention were only found in the groups using an external focus of attention.

Conclusion: Further research is needed in this area, as at present evidence is insufficient to draw conclusions regarding the effects of attentional focus on outcomes in musculoskeletal dysfunction.

Key Practice Points:

- An external focus of attention may be superior to an internal focus of attention during motor learning in people with lateral ankle sprain.
- There is insufficient evidence to draw conclusions regarding attentional focus in other musculoskeletal conditions.
- Further high quality evidence specific to attentional focus and taking into account the stage of learning of the participant is needed to make firm recommendations for clinical practice.

THE EFFECTIVENESS OF DIRECTIONAL PREFERENCE MANAGEMENT VERSUS ADVICE FOR SUBACUTE REDUCIBLE DISCOSCENIC LOW BACK PAIN: A RANDOMISED CONTROLLED TRIAL

Surkitt LD1, Ford JJ1, Hahne AJ1, Chan AYP2, Slater SL1, Richards MC1, Davidson M1, Hinman R3, Taylor NF3

1Department of Physiotherapy, La Trobe University, Melbourne
2Department of Physiotherapy, School of Health Sciences, The University of Melbourne

Question: Is physiotherapy guided directional preference management (DPM) more effective than advice for participants with subacute reducible discogenic low back pain.

Design: A multi-centre, parallel group, randomised controlled trial.

Participants: People with subacute reducible discogenic pain (6 weeks to 6 months) presenting with low back pain and/or referred leg pain.

Interventions: 10 sessions of DPM or 2 sessions of advice over 10 weeks.

Outcome Measures: Primary outcomes measures were back pain and leg pain (0 to 10 numerical pain rating scales) and activity limitation (Oswestry Disability Index).

Results: Seventy-eight participants (30 women, 48 men) were enrolled in the trial. Data were analysed using linear mixed models for continuous outcomes. This demonstrated significant and moderate sized between-group standardised mean differences (SMDs) favouring DPM over advice for back pain at 5 weeks (SMD 0.71, 95% CI: 0.26 to 1.16) and 10 weeks (SMD 0.64, 95% CI: 0.19 to 1.09), and leg pain at 10 weeks follow-up (SMD 0.53, 95% CI: 0.06 to 1.01). There were no significant between-group differences for back pain, leg pain or activity limitation at 26 weeks and one year follow-up.

Conclusion: Participants with subacute reducible discogenic low back pain who received DPM experienced more rapid short-term improvement in low back and leg pain compared with those who received advice, however significant between-group differences were not maintained at intermediate and long-term follow-up.

Key practice points:

- Providing specific treatment based on symptom response for LBP with a directional preference is widely used.
- Directional preference management may be more effective and provide more rapid short-term improvement than advice, however there were no differences between groups at intermediate and long-term follow-up.
- Mechanisms underpinning the results will be discussed.

DIRECTIONAL PREFERENCE MANAGEMENT FOR SUBACUTE LOW BACK PAIN: THE PATIENT’S PERSPECTIVE

Surkitt LD1, Pizzari T1, Ford JJ1, Hahne AJ1, Taylor NF3

1Department of Physiotherapy, La Trobe University, Melbourne

Question: Directional preference management is a common treatment for low back pain. Qualitative research attached to randomised controlled trials is becoming increasingly common, but is lacking in directional preference management studies. This study aimed to explore patient perspectives of directional preference management (based on the McKenzie method) in subacute low back pain.

Design: A physiotherapy program using directional preference management was developed targeting reducible discogenic low back pain and included advice, application of mechanical loading strategies, postural modification and motor control retraining. Participants in a randomised controlled trial who undertook this program underwent a semi-structured exit interview. Two researchers independently coded interview data using qualitative data analysis software and thematically analysed the results.

Participants: People with subacute reducible discogenic pain presenting with low back pain and/or referred leg pain.

FIESTNESS AND HEALTH RELATED QUALITY OF LIFE IN CHILDREN WITH LOW MOTOR COMPETENCE

Baum A1, McDonald J1, Sullivan A1, Watter P2

1Division of Physiotherapy, University of Queensland, Brisbane, Australia
2Melbourne School of Population and Global Health, the University of Melbourne, Melbourne, Australia

Question: What are the relationships between motor impairment, fitness and health related quality of life (HRQOL), in children with low motor fitness including flexibility and functional capacity, and health related quality of life (PedsQL). In children with low motor competency (LMC).

Design: Cross sectional study.

Participants: Children (n=17) referred to the University of Queensland Paediatric Clinic.

Outcome Measures: Motor competence was assessed with the Queensland Peadiatric Clinic.

Results: Overall, children with LMC scored below average on the PedsQL. Parent-proxy scores were lower across all domains, and parent-child agreement was poor. Significant associations were found between parent proxy scores and ball skills proficiency (p < 0.05). Parents also considered younger children to be functioning better than older children (p < 0.05). Children with LMC rated their social functioning within the clinical range. Although no significant relationship was demonstrated, children with LMC had a lower functional capacity than those without LMC. Flexibility was unrelated to motor competency.

Conclusion: Level of motor competence does significantly impact upon HRQOL, and possibly fitness, in children with LMC. The poor agreement between parent and child highlights the importance of using objective measures of HRQOL with multiple views. These findings are consistent with the literature regarding HRQOL in children with chronic health conditions, and to the authors knowledge is yet to be reported. The results of this study should be clarified in larger cohorts.

Key Practice Points:

-Fitness should be incorporated into assessment and treatment plans for children with LMC.
- HRQOL must be assessed from both parent and child perspective in children with LMC.
- It is essential to incorporate both parent and child goals in planning treatment direction, because their perspectives can differ so greatly.
Results: Twenty participants were interviewed and reported improvements in pain, activity limitation, self-management skills, knowledge (particularly regarding pathology) and strength/motor control. Some participants reported negative experiences, including setbacks with mechanical loading strategies, but most, these were discussed in the context of an overall positive experience.

Conclusion: Participants with subacute low back pain had a positive perspective on the aspects of a directional preference management program.

Key Practice Points:
• Directional preference management is a common treatment for low back pain.
• This treatment approach is well received by patients.
• The trend of excluding a pathoanatomical explanation from directional preference management should be reconsidered by practitioners and researchers.

WHEN NATURE CALLS: THE EFFECTS OF NUTRIENTS AND NATURAL CHEMICALS ON GUT FUNCTION

Tait A

For clinicians managing constipation, it is essential to be aware of the effects of pharmaceutical medications on the physiology of the gut. As patients are increasingly consumers of natural medicines, it is becoming important for clinicians to be equally cognizant of the impact of various natural supplements on gut function. Patients may present with a long list of natural medicines. What do you do when faced with this list? How well do you understand the function of these supplements, and their potential effect on bowel function? Is it possible to even encourage patients to try certain supplements to help their bowels, while still operating within an evidence-based framework? This presentation answers these questions and more, introducing you to a science-based approach into natural medicines and their relevance to bowel function.

IS DRIVING-RELATED PERFORMANCE IN PERSONS WITH CHRONIC WHIPLASH-ASSOCIATED DISORDERS SUFFICIENTLY IMPAIRED TO RECOMMEND FITNESS TO DRIVE ASSESSMENT?

Takasaki H, Ttreleaven J, Johnston V, Rakotonirainy A, Haines A, Jull G

1 NHMRC Centre of Clinical Research Excellence – Spinal Pain, Injury and Health, Division of Physiotherapy, School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane
2 Centre for Accident Research & Road Safety – Queensland, The University of Queensland, Brisbane

Question: Although driving is often nominated as problematic by patients with chronic whiplash-associated disorders (WAD), is their driving-related performance sufficiently impaired to recommend fitness to drive assessment?

Design: Cross-sectional.

Participants: Seventeen WAD and 26 control subjects of similar age, gender and driving experience.

Interventions: Participants were asked to drive in an advanced driving simulator for three driving scenarios (freeway, residential and a central business district (CBD)) were programmed. Total driving duration was 15 minutes.

Outcome Measures: Driving-related performance was assessed using the simulator performance index (SPI) which is calculated from 12 measures. The number of collisions, and reaction time and missed response ratio in the divided attention task were also examined.

Results: All subjects completed the freeway scenario but four withdrew during the residential and eight during the CBD scenario because of motion sickness. All scenarios were completed by 14 WAD and 15 control subjects. Mean scores for the SPI over the three scenarios was statistically lower in the WAD group (95% CI 24.4 to 33.2) and 38.2 points (95% CI 33.3 to 43.1) respectively.

Conclusion: Assessment of driving in an advanced driving simulator for 15 minutes revealed that driving-related performance in chronic WAD was not sufficiently impaired to recommend the need for fitness to drive assessment.

Key Practice Points:
• Driving difficulty is frequently noted in persons with chronic whiplash-associated disorders and their driving-related performance is slightly impaired in comparison to healthy individuals.
• However, the magnitude of the impairment is not substantial and fitness to drive assessment would not be necessary in most cases.
• Nevertheless, it is still unclear if their driving-related performance is comparable to healthy individuals when driving duration is prolonged. Further research will be required to address the question.

DEMYSTIFYING DIZZINESS: ELECTRONIC LEARNING TO EDUCATE PHYSIOTHERAPISTS

Talbot E, Lloyd M, Fleury K, McManus F, Grant C, Skinner EH

1 Western Health (WH), Melbourne
2 Monash University, Melbourne
3 The University of Melbourne, Melbourne

Question: Does an electronic learning package affect hospital physiotherapists' knowledge and confidence in the assessment and management of patients with dizziness?

Design: Observational cohort study.

Participants: 28 Western Health physiotherapists with varying clinical backgrounds (acute inpatient, emergency department, orthopaedics, neurology, chronic pain) and experience (46% Grade 1, 32% Grade 2 and 21% Grade 3) volunteered to participate.

Intervention: Five vestibular physiotherapy electronic learning modules were developed. Content was sourced from recent literature, published texts, websites and the clinical experience of WH staff with advanced training in vestibular rehabilitation, and included anatomy, assessment and management strategies.

Outcome Measures: Two electronic surveys were conducted pre and post completion of the learning modules: i) multiple choice survey of theoretical knowledge of the patient with dizziness; ii) self-reported efficacy of physiotherapists' perceived confidence in assessment and treatment of the patient with dizziness (rated on a 0-100 self-efficacy scale, where 0 = no confidence and 100 = maximum confidence).

Results: Theoretical knowledge scores improved from mean (SD) 6.3 (1.7) to mean (SD) 8.2 (1.4) out of 10 (mean difference 1.9 (95% CI 1.2 to 2.6), p < 0.001. Self-efficacy improved significantly (p < 0.001) across all surveyed elements of assessment and treatment, with the mean difference for completing a Hallpike maneuver and canalith repositioning technique of 28.8 points (95% CI 24.4 to 33.2) and 38.2 points (95% CI 33.3 to 43.1) respectively.

Conclusion: Electronic learning modules improve the theoretical knowledge and self-rated confidence of physiotherapists in the assessment and management of patients with dizziness.

Key Practice Points:
• Electronic learning modules significantly improved knowledge and self-reported confidence of physiotherapists in assessing and managing patients with dizziness.
• Future randomised controlled studies could concentrate on comparing the efficacy of different educational models, including practical training, in changing actual physiotherapy clinical practice.
UNWELL INPATIENTS ADMITTED TO HOSPITAL WITH ACUTE EXACERBATION OF COPD HAVE POSITIVE EXPERIENCES OF EXERCISE

Tang CY1,2, Taylor NF1, Blackstock FC3
1Department of Physiotherapy, La Trobe University, Melbourne
2Department of Physiotherapy, Sunshine Hospital-Western Health, Melbourne
3Institute for Breathing and Sleep, Melbourne

Question: How do inpatients admitted with acute exacerbation of chronic obstructive pulmonary disease (COPD) perceive an early exercise program?

Design: Qualitative study.

Participants: Nineteen participants from a randomised controlled trial who had been randomly allocated to do an exercise program while admitted to hospital with an acute exacerbation of COPD.

Intervention: Participants completed a twice-daily exercise session which included both aerobic and resistance exercises from the second day of admission to day of discharge. Participants exercised at either low or moderate to high intensity. A semi-structured interview was carried out within a week after discharge.

Outcome Measures: Using the information from the semi-structured interviews to formulate themes regarding the experiences and perception of patients who had undergone the exercise program. The themes were compared to the findings of the randomised controlled trial to explore any convergence of themes.

Results: Participants described their experience with the exercise program to be positive and beneficial, and reported an increased motivation towards exercising following discharge. These findings converged with the high levels of exercise adherence (83%) and within-group improvements in walking capacity observed in both exercise groups. Many participants reported commencement of a home exercise program after discharge but intention to participate in community pulmonary rehabilitation remained low.

Conclusion: An early inpatient exercise program was perceived as enjoyable and beneficial by patients with an acute exacerbation of COPD and increased their motivation towards exercising post discharge. However, intention to participate in pulmonary rehabilitation remained low.

Key Practice Points:
- Acutely unwell COPD patients perceive an early exercise program to be enjoyable and beneficial.
- COPD patients were motivated to exercise after the program with most patients reporting commencement of a home exercise program.
- Intention to participate in pulmonary rehabilitation following discharge remained low among COPD patients.

ADHERENCE TO GLOBAL INITIATIVE FOR CHRONIC OBSTRUCTIVE LUNG DISEASE (GOLD) GUIDELINES FOR INPATIENTS WITH ACUTE EXACERBATION OF COPD

Tang CY1,2, Taylor NF1, McDonald CF1,2 & Blackstock FC3
1Department of Physiotherapy, La Trobe University, Melbourne
2Department of Physiotherapy, Sunshine Hospital-Western Health, Melbourne
3Institute for Breathing and Sleep, Melbourne

Question: What is the level of adherence to GOLD guidelines for people admitted to hospital with an acute exacerbation of COPD?

Design: Clinical audit.

Participants: A random sample of 240 patients admitted to hospital with an acute exacerbation of COPD within a calendar year.

Intervention: Retrospective audit of medical histories using a 43-question series audit tool specifically designed to evaluate the level of adherence to GOLD guidelines. The audit focused on: appropriate hospital admissions, appropriate critical care unit admissions, pharmacological management, and non-pharmacological management.

Outcome Measures: Percentages of patients where the recommendations of GOLD guidelines were met. Odds ratios were calculated to evaluate if patients admitted under the respiratory team were more likely to receive guideline-recommended care than patients admitted under the general medical team.

Results: High levels of adherence to prescription of common bronchodilators (93%) and admission to critical care unit (100%) were observed. Only 63% of patient admissions met the GOLD admission criteria. Low levels of adherence to non-pharmacological management such as smoking cessation (25%) and referrals for outpatient pulmonary function tests (16%) were observed. Despite 63% of patients being referred to physiotherapy during admission, only 16% were referred to pulmonary rehabilitation at discharge. Patients admitted under the respiratory team were 2.6 times (95% CI 1.3 to 5.4) more likely to be referred to pulmonary rehabilitation than patients admitted under the general medical team.

Conclusion: There is a need to improve adherence to hospital admission guidelines and non-pharmacological management for inpatients admitted with an acute exacerbation of COPD.

Key Practice Points:
- As many as four in ten patients admitted to hospital with an acute exacerbation of COPD did not meet the GOLD admission criteria.
- Adherence to non-pharmacological management guidelines is very low.
- Further investigations are required to evaluate why in-patient physiotherapists do not refer patients to pulmonary rehabilitation.

PHYSICAL OUTCOMES POST PEDIATRIC LUNG TRANSPLANT – IMPLICATIONS OF EXTRA-CORPOREAL MEMBRANE OXYGENATION


Question: Lung transplantation is an established treatment for end-stage lung disease. Donor scarcity has resulted in the increased use of extra-corporeal membrane oxygenation as a bridge to transplant to minimise waitlist mortality. This study aims to evaluate the short-term physical outcomes of paediatric patients transplanted via extra-corporeal membrane oxygenation, an emerging field with limited data.

Design: Retrospective analysis.

Participants: All paediatric patients (n = 4, median age = 13) who underwent bilateral sequential lung transplant following extra-corporeal membrane oxygenation (veno-arterial = 2, veno-venous = 2). Indications for transplant: cystic fibrosis (1), acute lung injury (1), pulmonary vascular disease (2).

Intervention: A supervised outpatient exercise rehabilitation program for one hour, three times a week for one to three months. Outcome measure: Six-minute walk test compared to rehabilitation at a paired control of six paediatric patients who underwent bilateral sequential lung transplant without extra-corporeal membrane oxygenation use.

Results: Survival at three months was 100% for both groups. Extra-corporeal membrane oxygenation support median = 18 days (range = 2 to 35). Median time of outpatient rehabilitation for both groups was 72.5 days (treatment range 37 to 80, control 42 to 77), p = 0.67. Six-minute walk distance on discharge from rehabilitation was higher in the treatment group: median = 520 m (range 351 to 557), control: median = 476 m (399 to 503), p = 0.13. All patients progressed to jogging or running.

Conclusion: Extra-corporeal membrane oxygenation used prior to lung transplantation was not detrimental to short-term physical outcomes based on six-minute walk test distance.

Key Practice Points:
- Future challenges include the increasing use of extra-corporeal membrane oxygenation, including ambulatory circuitry, and the effect of this on physical outcomes post paediatric lung transplant
- Longer term studies are warranted
- Current practice at this institution is adequately addressing the physical rehabilitation requirements of this cohort, as compared to control
SURVEY: PRIORITY IMPORTANCE OF CODES OF PRACTICE FOR AGRICULTURE BY AGRIBUSINESS PROFESSIONALS, FARMERS AND THEIR WORKERS

Taylor A

Question: What do farmers and the Agribusiness professional perceive as the most important Codes of Practice for Agriculture.

Design: A survey in a simple format requiring 3 minutes to complete was designed and presented to a small sample of Tasmanians working in the Agriculture Industry to prioritize the Codes of Practice in order of importance.

Participants: Owners of and workers in Agricultural Businesses and the Agribusiness Professionals who support them.

Intervention: Results will be used to create awareness programs to agricultural workers and their advisors on the importance and useability of the Codes of Practice.

Outcome Measures: not applicable.

Results: Not yet completed.

Conclusion: Agricultural workers and the Agribusiness Professionals have limited awareness of the Codes of Practice and their importance to preventing injury

Key Practice Points:
• Agricultural workers are blissfully unaware of the existence of Codes of Practice and how to use them.
• Essential for more education programs to increase the awareness in the Agricultural Industry of the Codes of Practice and how to use them.

RESPIRATORY ISSUES IN AGRICULTURE

Taylor A

Question: Are workers in agriculture aware of the range and severity of respiratory hazards in their workplace?

Design: 2 case studies will be presented supported by information sourced from referenced publications of the range of respiratory issues and consequences.

Participants: Agricultural workers.

Intervention: the range of publications and mediums in which to inform healthcare workers, farmers, their service providers and industry organisations when conducting an awareness program.

Outcome Measures: hearsay as a survey has not been conducted.

Results: nothing obtained.

Conclusion: Exposure to respiratory toxins are an everyday occurrence in some agricultural enterprises and seasonal in other agricultural enterprises, with the workers and business owners unaware of the long term consequences or how to consistently reduce the risk or effectively control the hazard.

Key Practice Points:
• Agricultural workers are blissfully unaware of respiratory issues.
• Essential for more education programs to increase the awareness in the rural community of the respiratory issues in agriculture.
• There is a need to conduct awareness programs to target multidisciplinary groups, including healthcare workers, farmers and their advisors, service providers and agricultural organisations.

ARE THE RISK FACTORS FOR HAMSTRING MUSCLE STRAIN INJURIES IN THE AFL CHANGING?

Pizzari T1,2, Taylor RB1,2, Coburn P2.

1School of Physiotherapy, La Trobe University
2Mill Park Physiotherapy Centre
3Alphington Sports Medicine Clinic

Design: Retrospective cross-sectional design was used for this study for the 2011 AFL season.

Participants: Approximately 796 players across all of the 17 AFL clubs competing in the 2011 Season participated in the study.

Intervention:

Outcome Measures: Data were collected on player factors, injury details, extrinsic factors, and recovery information associated with the injured player and the hamstring injury for the 2011 AFL season.

Results: Ninety-one hamstring muscle strain injuries from 75 players were reported. Sixteen injuries were recurrent strains (21%) and of these, three players had two recurrences. Players aged <20 years were 1.7 times more likely to sustain an injury than those aged 20–24 years. The biceps femoris muscle was injured in 85% of cases, most commonly at the distal musculotendinous junction. Hamstring injuries occurred mostly during games, in the third quarter, in the later rounds of the season and during or the week following playing on a harder ground. Workload data revealed a greater game time percentage three weeks prior to injury.

Conclusion: Previous research from the 2002 AFL season showed players over 24 years old were four times more likely to sustain a hamstring injury than those under 20 years. The reverse was true in 2011 and might reflect the changing nature of the game. Considering that injuries occurred later in games, later in the season, following and during playing on harder grounds, and following an increased game load it could implicate cumulative loading and fatigue as associated factors in hamstring injury.

Key Practice Points:
• Players under the age of 20 years are at an increased risk of sustaining a hamstring muscle strain injury.
• Players are more likely to sustain hamstring muscle strain injuries in later rounds of the season.
• Increased cumulative loads may increase the risk of sustaining a hamstring muscle strain injury.

MULLIGAN’S MOBILISATION-WITH-MOVEMENT AND EXERCISE VERSUS EXERCISE ALONE FOR PATIENTS WITH MUSCULOSKELETAL SHOULDER PAIN: A PILOT STUDY

Teyss P1,2, Smith MF, Bisset L1,3

1Griffith University, Gold Coast
2Australian Catholic University, Brisbane
3Gold Coast Hospital and Health Service, Gold Coast

Question: Is Mobilisation-with-Movement and exercise superior to exercise alone in the treatment of painful shoulders?

Design: Pilot randomised controlled trial with concealed allocation, blinded assessor and intention-to-treat analysis.

Participants: 14 volunteers (aged 50.6 ±11 years) with a history of shoulder pain greater than 6 weeks.

Intervention: 4 treatment sessions of either supervised therapeutic exercise, shoulder mobilisation and tape, or supervised therapeutic exercise program alone.

Outcome Measures: Pain and function (100mm visual analogue scale), Shoulder Pain and Disability Index, mechanical, heat and cold hyperalgesia, and pain-free active range of shoulder elevation were measured at baseline, 4 and 8 weeks.

Results: There were no significant differences between groups over time. A between group difference of 19 mm (95%CI -18.4 to 56.5; p=0.3) between baseline and 8 weeks follow-up for cold hyperalgesia, and pain-free active range of shoulder elevation were measured at baseline, 4 and 8 weeks.

Conclusion: Significant improvements across a range of measures are evident for both exercise and multimodal treatments. This study provides preliminary evidence to justify a larger, fully powered clinical trial.

Trial registration: NCTR123456.

Key Practice Points:
• Therapeutic exercise, with and without mobilisation with movement and tape, produce significant improvement in the short term.
• There may be clinically important differences favouring the multimodal treatment.
• These preliminary findings justify an appropriately powered clinical trial with a larger sample size.

MUSCULOSKELETAL SHOULDER PAIN: A PILOT STUDY

Teys P1,2, Smith MF, Bisset L1,3

1Griffith University, Gold Coast
2Australian Catholic University, Brisbane
3Gold Coast Hospital and Health Service, Gold Coast


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• Therapeutic exercise, with and without mobilisation with movement and tape, produce significant improvement in the short term.
• There may be clinically important differences favouring the multimodal treatment.
• These preliminary findings justify an appropriately powered clinical trial with a larger sample size.
RECOGNITION OF PATIENTS PRESENTING WITH OR AT RISK OF CRANIOCERVICAL ARTERIAL DISSECTION: PRELIMINARY RESULTS OF A PROSPECTIVE STUDY

Thomas L1, Rivett D1, Levi C2
1School of Health Sciences, The University of Newcastle, Newcastle 2Department of Neurology, John Hunter Hospital, New Lambton Heights

Questions: What are the risk factors for craniovertebral arterial dissection? What are the common presenting features of craniovertebral arterial dissection? Do patients presenting with craniovertebral arterial dissection have antecedent ischaemic neurological signs and symptoms?

Design: Prospective case control study.

Participants: Thirty-five patients aged 55 years with radiologically confirmed vertebral or internal carotid artery dissection (21 from the Hunter region, NSW and 14 from other Australian sites in the CADISS drug trial).

Outcome Measures: Exposure to risk factors for dissection such as recent minor mechanical neck trauma and infection, the presence of vascular anomaly, connective tissue disease and cardiovascular risk factors were identified and compared between cases and controls. Characterisation of presenting clinical features was made, including any ischaemic features in the preceding month.

Results: Thirty-five dissection participants (49% vertebral artery, 50% M) with a mean age of 45 years were identified. Of these, 51% reported recent minor mechanical head or neck trauma (p < 0.001), 11% percent reported neck manipulation. In internal carotid artery dissection, 22% participants reported recent infection. Thirty-one percent of all dissection participants were smokers, 23% had hypertension and 26% had migraine (p = 0.13). Eighty-three percent of participants presented with headache, 54% with neck pain, and 68% of participants reported transient neurological symptoms (dizziness, upper limb paraesthesia/weakness, imbalance and visual disturbance) within the preceding month.

Conclusion: Preliminary results suggest recent mechanical head/neck trauma, migraine and smoking may be associated with dissection. Infection may be important in internal carotid artery dissection. Precluding transient neurological symptoms commonly occur.

Key Practice Points:
• Clinicians should question patients presenting with unusual headache or neck pain about recent head/neck trauma
• Clinicians should be alert to symptoms of transient neurological dysfunction in patients presenting with unusual head/neck pain.
• If clinicians suspect arterial dissection is in progress patients should be urgently referred to their nearest emergency department.

THE EFFECT OF SELECTED MANUAL THERAPY INTERVENTIONS FOR MECHANICAL NECK PAIN ON VERTEBRAL AND INTERNAL CAROTID ARTERIAL BLOOD FLOW AND CEREBRAL INFLOW

Thomas L1, Rivett D1, Levi C2
1School of Health Sciences, The University of Newcastle, Newcastle 2Department of Neurology, John Hunter Hospital, New Lambton Heights

Question: Do certain neck positions used in common manual therapy procedures have greater effect on craniovertebral arterial blood flow and cerebral inflow than others?

Design: Experimental observational MRI study.

Participants: Twenty healthy adults.

Intervention: Participants were imaged using MRI in the following neck positions: neutral, rotation, rotation/distraction (similar to a Cyriax manipulation), C1–C2 rotation (similar to a Maitland or osteopathic manipulation), and distraction.

Outcome Measures: Average blood flow volume was compared between the neutral and each of the experimental neck positions to determine any change from neutral. Total blood supply to the brain was determined from the sum of average flow volume (ml/s) in both vertebral and both internal carotid arteries and compared between positions.

Results: All participants had normal vascular anatomy and intact Circle of Willis. Average inflow to the brain in neutral was 6.98 ml/s and was not significantly changed by any of the test positions. There was no significant difference in flow in any of the four arteries in any position from neutral, despite large individual variations. No participants reported any signs or symptoms of vertebrobasilar insufficiency.

Conclusion: Blood flow to the brain does not appear to be compromised by positions commonly utilised in manual therapy.

Key Practice Points:
• End-range rotation and distraction appear no more hazardous to cerebral circulation than localised neck positions.
• Blood flow reduction in one cervical artery appears to be adequately compensated by the other vessels in participants with normal vascular anatomy.
• Clinicians should monitor patients for vertebrobasilar insufficiency in case of abnormal vascular anatomy.

VENTILATOR HYPERINFLATIONS – LESSONS LEARNT FROM A BENCH-TOP ANALYSIS

Thomas PJ
Royal Brisbane and Women’s Hospital, Brisbane

Question: When utilising ventilator hyperinflation techniques, what mechanical ventilation settings are associated with attaining peak inspiratory and peak expiratory flow rates that are considered effective for airway clearance?

Design: Bench-top analysis utilising test lung simulators.

Participants: Nil.

Intervention: A mechanical ventilator was connected to two lung simulators and a respiratory mechanics monitor. Peak inspiratory and expiratory flow rates were measured during manipulation of ventilator modes (Pressure Support, volume and pressure controlled ventilation). Within each mode, ventilator settings were manipulated (including set tidal volume, PEEP, inspiratory flow rate, inspiratory pause, Pressure Support, inspiratory time and/or inflation pressure). Additionally, each trial was conducted with high (0.05 L/cmH2O) and low (0.01 L/cmH2O) compliance settings on the lung simulators.

Outcome Measures: Each trial was dichotomised into success or failure under three categories – attainment of inspiratory to expiratory flow rate bias ≤ 0.9, peak expiratory flow rate > 17 L/min and peak expiratory minus inspiratory flow ≥ 40 L/min.

Results: 232 trials were conducted (96 volume controlled, 96 pressure controlled, 40 Pressure Support). Within each ventilator mode, specific changes in ventilator settings or test lung compliance did influence the success of a trial against each outcome measure. However, the effect of ventilator settings or compliance on success varied between the outcome measures. Only 10 Pressure Support, 10 volume controlled and seven pressure controlled trials achieved success against all three outcome measures.

Conclusion: The evaluation of the effect of ventilator settings or lung compliance on the effectiveness of ventilator hyperinflation for airway clearance is dependent on the primary outcome measure utilised.

Key Practice Points:
• Assessment of the theoretical capability of ventilator hyperinflation techniques to be effective for airway clearance is affected by which outcome measure/s is/are utilised to define success.
• When performing ventilator hyperinflations, physiotherapists should monitor peak inspiratory and expiratory flow rates and adjust ventilator settings in order to gain flow rate bias, peak expiratory flows and flow rate differences inferred for airway clearance.
• Future clinical research should consider the association between airway clearance and outcomes that utilise peak inspiratory and expiratory flow.
**SHOULD WOMEN WITH PELVIC FLOOR DYSFUNCTION DO SIT-UPS?**

Deeble M, French S, Thompson J, Andrews A, Briffa NK  
*Curtin University, Perth*

**Question:** As women with prolapse or urinary incontinence are often advised to avoid activities like sit-ups, this study addressed the question: What is the change in intra-abdominal pressure during abdominal curl and cough in women with pelvic organ prolapse and/or urinary incontinence?

**Participants:** 30 participants, with diagnosed pelvic organ prolapse stage 1-3 and/or urinary incontinence, were recruited from patients presenting for urodynamic study. Participants were allocated into pre and post menopausal and high and low body mass index groups.

**Intervention:** Change in intra-abdominal pressure was measured by multichannel cystometry through transvaginal sensors whilst participants performed three abdominal curls and three maximal cough manoeuvres.

**Outcome Measures:** Intra-abdominal pressure change was recorded in cmH\(_{20}\).

**Results:** Cough generated higher change in pressure than abdominal curl (mean (SD) 58.9 (40.1) versus 30.7 (22.1) cmH\(_{20}\) respectively, p = 0.004) however large variations in change in pressure were observed within and between participants (range 1.67 to 159.66 cmH\(_{20}\) for cough; and 4 to 81.67 cmH\(_{20}\) for abdominal curl). Menopausal status and body mass index were not associated with intra-abdominal pressure generation during the activities.

**Conclusion:** The large variability in the change in intra-abdominal pressure generated during abdominal curl suggests that restricting sit-ups may be important in some women but restrictive in others. The reason for the large variability and the effects of repetitive activities on abdominal pressure generation are unknown. Further investigation of repetitive activities on the pelvic floor in women with pelvic organ prolapse and urinary incontinence is required.

**Key Practice Points:**
- No one model of care is appropriate for all women with incontinence and prolapse.
- Advice for women with incontinence and prolapse performing exercises that increase intra-abdominal pressure needs to be individualized.
- Further high quality studies are needed.

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**PREVENT TRIAL PROTOCOL: NEUROPHYSIOLOGY EDUCATION EXPLAIN PAIN TO PREVENT CHRONIC LOW BACK PAIN**

Traeger A, Huebscher M, Moseley L, Nicholas M, Henschke N, Refshauge K, McAuley J  
*Neuroscience Australia*

**Question:** What is the effect of neurophysiology education on recovery from an episode of acute low back pain?

**Design:** Randomised placebo-controlled trial with concealed allocation, assessor blinding and intention-to-treat analysis

**Participants:** 250 participants with acute non-specific low back pain, identified as being at high risk of poor prognosis.

**Intervention:** The intervention group will receive NHMRC guideline care plus two, one-hour sessions of neurophysiology education “Explain Pain” with a physiotherapist. The intervention will use pain biology to explain two key concepts: (i) pain is protective, not a robust informer of tissue pathology; (ii) pain can give an overestimate of the state of the tissues. The control group will receive NHMRC guideline care plus two, one-hour sessions of sham advice with a physiotherapist.

**Outcome Measures:** The primary outcome will be risk of having pain at 3-months (+1 on Pain Numerical Rating Scale). Participants will be followed up at 3, 6 and 12-months. Secondary outcomes will be measured pre- and post-intervention, including disability (Roland-Morris Disability Questionnaire), depression (Depression Anxiety and Stress Scale), catastrophising (Pain Catastrophising Scale), satisfaction (Patient Satisfaction Questionnaire), knowledge (Neurophysiology of Pain Questionnaire), pain beliefs (Survey of Pain Attitudes 2-Item Scale), treatment expectancy (Credibility and Expectancy Questionnaire), fear (OMPSTQ fear items) and self efficacy (Pain Self Efficacy Questionnaire).

**Results:** The study is now underway.

**Conclusion:** This study will test a novel way of addressing risk factors for poor prognosis in acute low back pain.

**Key Practice Points:**
- Physiotherapists need effective ways of addressing psychosocial risk factors in acute low back pain.
- This RCT will test a new treatment aimed at risk factors, that can be easily implemented by physiotherapists.

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**SHORT-TERM OUTCOMES OF A STUDENT-ASSISTED, INTER-PROFESSIONAL COMMUNITY REHABILITATION SERVICE IN REGIONAL AUSTRALIA**

Thorne K, Lawrence W, Barker RN, Brown LH  
*Community Rehab nQ, Townsville, QLD*

**Question:** Does participation in a novel, five-week student-assisted inter-professional community rehabilitation program benefit individuals with a neurological condition in regional Australia?

**Design:** Prospective observational study of outcome measures from Community Rehab nQ’s first year of operation (2012-2013).

**Participants:** A convenience sample of individuals with neurological conditions participating in rehabilitation programs at Community Rehab nQ.

**Intervention:** Participation in one or more rehabilitation programs that included both group and individual sessions in intensive five-week cycles. Participants established short-term goals. Programs were then delivered as appropriate for the individual’s condition and goals, by physiotherapy, occupational therapy, speech pathology and exercise physiology professionals and students, using an inter-professional model of care.

**Outcome Measures:** Pre- and post-cycle self-assessed progress toward the goal, recorded as 0 to 10, and pre- and post-cycle therapist-assessed Australian Therapy Outcome Measures (AusTOMs) ‘participation’ and ‘distress/wellbeing’ measures, recorded on a five-point scale. Differences between pre- and post-cycle outcome measures were compared using Wilcoxon Sign Rank test.
CHARACTERISTIC FEATURES OF HEADACHE IN CHRONIC WHIPLASH
Treleaven J, Athithan G, Lynam J, Tripp E
Division of Physiotherapy, CCRE-Spine, School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, Australia

Question: Are there clearly defined group or groups of headaches within a chronic whiplash population.

Design: Prospective observational study.

Intervention: Seventy-eight participants with chronic whiplash and headache completed the Neck Disability Index (NDI) and a headache questionnaire, reporting symptoms and aggravating factors.

Outcome Measures: A descriptive analysis was performed and comparisons were made based on responses from the NDI headache item and selected established self-report criteria for cervicogenic, tension and migraine headache forms.

Results: Headache occurring as a result of the accident was reported by 95% of patients with only 21% reporting headaches prior to the accident and of these, 57% reporting a new headache type. All subjects had one or two criteria from each headache type and none could be classified into a particular headache form. No significant differences in headache characteristics between participants could be seen with respect to headache side change, presence of aura, pre-accident headaches and provocation by awkward postures. Subjects reporting severe/frequent headache compared to moderate infrequent headache reported significantly higher rates of throbbing and excruciating pain. Discussion: No clearly defined headache type was identified and most subjects presented with a mixed headache form. Future research is needed to determine whether in those with persistent whiplash there is a unique headache type and whether factors such as widespread central changes and/or psychological issues play a role in how a headache is perceived.

Key Practice Points:
• Headache is common in those with chronic whiplash and does not appear to be related to pre-existing headache.
• No clearly defined headache type was identified and most presented with a mixed headache form.
• Clinicians should consider these factors for differential diagnosis of headache in chronic whiplash patients.

DIZZINESS AND UNSTEADINESS IN PATIENTS WITH CERVICAL DISC DISEASE, COMPARISON OF SYMPTOMS AND SIGNS PRE AND POST SURGERY
Treleaven J, Wibault J, Kammerlind A, Peolsson A
Division of Physiotherapy, CCRE-Spine, School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, Australia and Department of Medical and Health Sciences, Physiotherapy, Faculty of Health Sciences, Linköping University, Futurum, Ryhov Hospital, Jönköping, Sweden

Question: What proportion of patients operated for cervical disc disease (CDD) have self-reported dizziness and unsteadiness before surgery, does surgery improve these symptoms and do these patients present differently to those not complaining of these symptoms.

Design: Prospective observational study.

Intervention: One hundred and forty participants who underwent surgery for CDD completed a clinical evaluation before and 3 months post surgery.

Outcome Measures: Self-assessed dizziness and unsteadiness measured using visual analogue scales (0-100 mm) and questionnaires regarding the frequency and intensity of symptoms of dizziness and unsteadiness, neck disability index (NDI), figure of eight test, sharpened rhomberg test, head repositioning accuracy (HRA) left and right and pre-operative neck muscle endurance (NME) and cervical range of motion (ROM).

Results: Forty-seven percent of subjects reported dizziness and unsteadiness preoperatively. At three months post operatively, 25% of all subjects still complained of dizziness/unsteadiness. These patients were younger, had greater HRA, NDI and less pre-operative NME and trends for poorer performance on figure of eight and sharpened rhomberg compared to those not reporting these symptoms postoperatively. Discussion: The results show that a significant proportion of these patients complain of symptoms and signs relating to dizziness and unsteadiness and these do not necessarily resolve in all patients post operatively. There should therefore be improved care after surgical intervention for these patients. The study provides important information for a structured and active physiotherapy rehabilitation program post CDD surgery.

Key Practice Points:
• Symptoms of dizziness and unsteadiness and deficits in balance and cervical proprioception persist in one quarter of patients who undergo surgery for cervical disc disease.
• This might be related to levels of pain and disability and poor muscle endurance rather than reduced ROM.
• This points to a need for postoperative physiotherapy intervention and rehabilitation specifically addressing these impairments.

THE EFFECT OF NECK TORSION ON JOINT POSITION ERROR IN SUBJECTS WITH CHRONIC NECK PAIN
Chen X, Treleaven J
Division of Physiotherapy, CCRE-Spine, School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane

Question: The conventional cervical joint position sense (JPS) test has been used as a measure of cervical afferent dysfunction in people with neck pain. However, head movement during the test may also stimulate the vestibular system. Is a new test, the modified JPS test with a neck torsion manoeuvre, a unique measure of cervical afferent dysfunction?

Design: Randomised, within-participant experimental study.

Intervention: Twenty-five volunteers with chronic neck pain and 26 healthy controls aged 18 to 60 were assessed on three tests of JPS: ‘JPS conventional’, ‘JPS torsion’ and ‘Enbloc’ using Fastrak and or laser apparatus.

Outcome Measures: Average absolute error in degrees between starting and finishing position of the head or trunk for each test.

Results: The neck pain group was found to have significantly greater joint position error (JPE) in one conventional JPS test and almost all the torsion tests (p < 0.05). No differences in Enbloc tests were seen. Moderate to strong significant correlations were also seen between measures of JPS for all Fastrak and laser tests (p < 0.01).

Conclusion: The results indicate that ‘JPS torsion’ may be a more effective test than the conventional test for cervical afferent dysfunction in people with chronic neck pain. Additionally, the laser method is comparable to Fastrak and may be useful as a clinical measure of repositioning errors for both conventional and torsion tests. Future comparisons with people suffering from vestibulopathy is warranted to support these findings.

Key Practice Points:
• Cervical JPS reflects proprioception and is impaired in chronic neck pain.
• Modifying the cervical JPS test using neck torsion may be useful to help clinicians in differential diagnosis.
• The laser method of measuring cervical JPS is comparable to a more sophisticated measurement method and thus a useful measure for clinicians.
RESULTS: Fifty-four participants (mean age (SD) 71 (10) years), with average length of stay of 5 (1) days completed the study. There was no significant improvement in the total number of steps walked in the hospitalisation period (Day 2, mean (SD) 1248 (237); Day 3, 1354 (276); Day 4, 1434 (270); ANOVA p > 0.05). There was also no significant difference in sedentary time in total minutes (i.e. time spent between 1-1.5 METs) in the hospitalisation period (Day 2, mean (SD) 240 (251); Day 3, 262 (279); Day 4, 227 (225); ANOVA p > 0.05). FEV1 % predicted significantly increased from 33 (13) on Day 2 to 41 (17) on day of discharge (p = 0.0001). Six minute walk distance was 184 (126) metres or 30 (22) % predicted.

CONCLUSION: Physical activity did not change over the hospitalisation period in people admitted with an acute exacerbation of COPD. Spirometry improved over the hospitalisation period.

Key Practice Points:
• Physical activity does not change in the hospitalisation period when people with COPD are admitted with an acute exacerbation.
• Lung function, measured via spirometry, improves during the hospitalisation period.
• Functional exercise capacity is low in people with COPD at discharge following an acute exacerbation of COPD.

Clinical Trial No: ACTRN 12611000369921

PHYSICAL ACTIVITY LEVELS IMPROVE IN PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE FOLLOWING HOSPITALISATION FOR AN ACUTE EXACERBATION

Tsai LL1,2, McKeeough ZJ2, McKenzie DM1, Alison JA2
1Prince of Wales Hospital, Randwick
2The University of Sydney, Sydney

Question: Does the level of physical activity improve in people with an acute exacerbation of chronic obstructive pulmonary disease following discharge from hospital?

Design: Prospective observational study.

Participants: Fifty-four patients who received usual medical and physiotherapy care while in hospital. Once discharged home, there was no further physiotherapy intervention.

Outcome Measures: The SenseWear™ Armband was used to monitor participants’ physical activity levels during the hospitalisation period (T1), during the first week at home (T2), and six weeks after the date of admission (T3). Spirometry was performed on Day 2 of hospitalisation, at discharge, and at T3. Six minute walk tests were completed at T2 and T3.

Results: Fifty-four participants (mean age (SD) 71 (10) years), completed the study. There was a significant linear increase in average steps per day across the three time periods (T1, mean (SD) 1411 (284); T2, 1989 (368); T3, 2178 (374); p = 0.005) and in physical activity duration (minutes per day) across the three time periods (T1, mean (SD) 60 (13); T2 78 (15); T3, 85 (15); p = 0.023). FEV1 % predicted also significantly increased (T1, mean (SD) 32 (13); at discharge, 39 (17); T3, 42 (17); ANOVA p > 0.0001). Six minute walk distance significantly increased by 66 metres (95% CI 33 to 98).

Conclusion: Improvements in physical activity, spirometry and exercise capacity were shown up to six weeks following an acute exacerbation of chronic obstructive pulmonary disease requiring hospitalisation.

Key Practice Points:
• Physical activity, spirometry and exercise capacity increase in the six weeks following admission for an acute exacerbation of chronic obstructive pulmonary disease.
• The SenseWear™ armband is a useful tool for monitoring physical activity in hospital and in participants’ homes following an acute exacerbation of chronic obstructive pulmonary disease.

Clinical Trial No: ACTRN 12611000369921
PERCEPTIONS OF IDIOPATHIC TOE WALKING BY PAEDIATRIC PHYSIOTHERAPISTS: DEFINITION, ASSESSMENT AND TREATMENT

Turley RT\(^1\), Gray, K\(^1\)
\(^1\)The Children's Hospital at Westmead, Sydney

Idiopathic toe-walking continues to be a conundrum, with no consensus in the literature regarding definition, assessment and treatment.

**Question:** What is the current opinion amongst Australian physiotherapists working in pediatrics regarding the definition, assessment and treatment of idiopathic toe-walking?

**Design:** Survey

**Participants:** physiotherapists working in pediatrics across Australia.

**Outcome Measures:** Identify if physiotherapists working in pediatrics consider idiopathic toe-walking an acceptable part of development. Compile the range of assessments and treatments being used and when these physiotherapists feel they are indicated.

**Results:** 62 physiotherapists completed the survey. Respondents worked in a variety of settings including hospitals, the community and private practice with experience ranging from less than two years to greater than 20 years. Every state and territory except Western Australia was represented. 60% of respondents felt that idiopathic toe-walking was an acceptable part of normal development with 69% reporting it acceptable until three years of age. An extensive range of assessments were documented including: musculoskeletal, orthopaedic, neurological, sensory and developmental. 97% of respondents provided treatment when passive range of movement was affected, with 68% providing treatment in cases with normal range of movement. The most effective treatment reported were walking casts (30%) with participation in aquatic physiotherapy in the early post-operative period.

**Conclusion:** There is limited consensus regarding the definition and assessment of idiopathic toe-walking. The majority of respondents would treat idiopathic toe-walking when there is normal passive range of movement. Nearly all would treat when passive range of movement is affected. Future research is required.

**Key Practice Points:**
- There is limited consensus regarding the definition and assessment of idiopathic toe-walking with many considering it a normal part of development in children less than three years of age.
- Almost all of the physiotherapists treat idiopathic toe-walking when passive range of movement is affected.
- 68% of respondents would treat idiopathic toe-walking when passive range of movement is not affected.

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EARLY AQUATIC PHYSICAL THERAPY IMPROVES FUNCTION AND DOES NOT INCREASE RISK OF WOUND-RELATED ADVERSE EVENTS FOR ADULTS AFTER ORTHOPEDIC SURGERY

Villalta E\(^1\), Peiris C\(^1\)
\(^1\)Allied Health Clinical Research Office, Eastern Health, Melbourne

**Question:** Is early postoperative aquatic therapy safe and effective to improve functional outcomes after orthopedic surgery?

**Design:** Systematic review with meta-analysis.

**Participants:** Adults less than three months after orthopedic surgery.

**Intervention:** Databases MEDLINE, CINAHL, AMED, Embase, and PEDro were searched from the earliest date available until October 2011 for controlled trials evaluating the effects of aquatic physical therapy post orthopedic surgery. Two reviewers independently applied inclusion and exclusion criteria and assessed methodological quality of included trials. Pooled analyses were performed using random effects model with inverse variance methods to calculate standardized mean differences and 95% confidence intervals (CIs) (continuous outcomes) and risk difference and 95% CIs (dichotomous outcomes).

**Outcome Measures:** Adverse events in relation to wound healing, measures of impairment (edema, pain, strength and range of motion (ROM)), activity (ADLs), and participation, as indicated by quality of life (QOL).

**Results:** Searching identified 5069 potentially relevant articles, of which 8 controlled trials with 287 participants met inclusion criteria. When compared with land-based physical therapy, early aquatic physical therapy does not increase the risk of wound-related adverse events (risk difference = 0.01, 95% CI -0.05 to .07) and results in improved performance of activities of daily living (SMD 0.33, 95% CI 0.07 to 0.58, I\(^2\) = 0%). There were no significant differences in edema (SMD -0.27, 95% CI -0.81 to 0.27, I\(^2\) = 58%) or pain (SMD -0.06, 95% CI -0.50 to 0.38, I\(^2\) = 34%).

**Conclusion:** After orthopedic surgery aquatic physical therapy improves function, does not increase the risk of wound-related adverse events and is as effective as land-based therapy in terms of pain, edema, strength, and range of motion in the early postoperative period.

**Key Practice Points:**
- Adults post orthopedic surgery may safely participate in aquatic physical therapy without increased risk of wound infection.
- Participation in aquatic physiotherapy in the early post-operative period is functionally beneficial.
- Aquatic physiotherapy is an alternative, effective treatment to land based therapy post orthopedic surgery.

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THE SHOULDER FUNCTION INDEX (SFINX): A NEW WAY TO MEASURE FUNCTION AFTER SHOULDER FRACTURE

Van De Water A\(^1\), Davidson M\(^1\), Shields N\(^1\), Evans M\(^2\), Taylor N\(^1\)
\(^1\)Department of Physiotherapy, School of Allied Health, La Trobe University, Bundoora
\(^2\)Melbourne Orthopaedic Group, Windsor

**Objective:** To validate the Shoulder Function Index (SFINX), a new tool to assess shoulder function after fracture.

**Participants:** 225 consecutive patients who sustained a shoulder fracture were recruited. The sample was divided into an initial cohort of 157 patients and a validation cohort of 68 patients.

**Design:** Prospective observational study.

**Outcome Measures:** Shoulder function was assessed using the Western Ontario Shoulder Instability Index (WOSI), Disabilities of the Arm, Shoulder and Hand (DASH), and SFINX.

**Results:** The SFINX correlated well with the WOSI (dichotomous outcomes) and DASH (continuous outcomes) and had high inter-rater reliability. The SFINX was found to be a valid and reliable measure of shoulder function after fracture.

**Conclusion:** The SFINX is a valid and reliable tool for assessing shoulder function after fracture.

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ROLE REFORMATION AT THE ROYAL CHILDREN’S HOSPITAL, MELBOURNE – REFLECTIONS AND RECOMMENDATIONS

Vladusic S

In 2005, our career paths took a new direction when we were appointed to the Department of Orthopaedics, to establish and run the Orthopaedic Assessment Clinic (OAC). This service delivery model was the first of its kind for paediatric orthopaedics in Australia.

In the current health climate, role reformation and advanced practicer roles are becoming increasingly popular as a means of delivering efficient and effective healthcare in the hospital outpatient setting. The support of the orthopaedic surgeons is essential to the success of these roles.

The OAC has proved to be a very successful initiative for our hospital which has resulted in definite benefits for the orthopaedic management of our population.

Working closely with our paediatric orthopaedic surgeons has provided us with insight into ‘what paediatric orthopaedic surgeons wish every physiotherapist knew’. We are pleased to be able to share their recommendations and our clinical perspectives on a variety of paediatric orthopaedic conditions, including scoliosis, foot deformities and developmental dysplasia of the hips (DDH).
VALIDATION OF THE CHRONIC RESPIRATORY DISEASE QUESTIONNAIRE IN NON-CYSTIC FIBROSIS BRONCHIECTASIS

Vodanovich DA1, Bicknell TJ1, Holland AE2,3,4, Hill CJ1,5, Cecins N6,7,8, Jenkins SS1,2,4, McDonald CF3,4, Burge AT2, Lee AL2,9
1Western Health 2Alfred Hospital 3Institute for Breathing and Sleep 4La Trobe University 5Austin Health 6Sir Charles Gairdner Hospital 7Curtin University of Technology 8The University of Melbourne

Question: Is the Chronic respiratory disease questionnaire a valid and reliable measure of health-related quality of life in non-cystic fibrosis bronchiectasis?

Design: Prospective, observational study.

Participants: Symptomatic participants with stable bronchiectasis of any aetiology.

Intervention: Internal consistency was assessed using cronbach’s alpha, while validity was measured by correlations with other quality of life questionnaires. Over 8 weeks, reliability was evaluated in 42 stable participants using intra-class correlation coefficients and sensitivity to change over 6 months was measured using effect sizes.

Outcome Measures: Health-related quality of life was measured using the self-administered Chronic respiratory disease questionnaire, St George’s respiratory questionnaire, Leicester cough questionnaire and the Hospital anxiety and depression scale.

Results: A total of 85 participants with mean FEV1 of 73% predicted were included. Internal consistency of the Chronic respiratory disease questionnaire was adequate (> 0.7) for all domains and the total score. Test-retest reliability ranged from an ICC of 0.69 to 0.85 for each domain and 0.82 for total score. Fatigue, emotional function and mastery had a moderate relationship with the St George’s respiratory questionnaire domains (r = -0.47 to -0.68) and the total score of the Leicester cough questionnaire (r = 0.41 to 0.62). Lower scores on the Chronic respiratory disease questionnaire were associated with higher levels of anxiety and depression (r = -0.46 to -0.56). Changes over 6 months were minimal (effect sizes of 0.1 to 0.24).

Conclusions: The Chronic respiratory disease questionnaire is a valid and reliable measure of health-related quality of life in non-cystic fibrosis bronchiectasis.

Key Practice Points:
- The chronic respiratory disease questionnaire demonstrated high internal consistency in this patient group
- The chronic respiratory disease questionnaire is a valid and reliable measure of quality of life in non-cystic fibrosis bronchiectasis
- Responsiveness of this questionnaire should be tested in physiotherapy interventions.

COMMUNITY MOVES: ENHANCING PHYSIOTHERAPY STUDENTS EXPERIENCES ON CLINICAL PLACEMENT THROUGH COMMUNITY ENGAGEMENT

Wakely L
University of Newcastle Department of Rural Health, New South Wales

Question: Do physiotherapy student perceive opportunities for community engagement while on clinical placement as beneficial?

Design: The University of Newcastle Department of Rural Health has integrated community engagement activities with physiotherapy clinical placements. These activities aim to provide students with a unique opportunity to engage with community groups and address the health needs of the local community. This paper aims to describe physiotherapy student involvement in the community engagement programs and describe student’s perspectives on the value of the activities.

Participants: Undergraduate physiotherapy on clinical placement supported by the Department of Rural Health.

Intervention: Community engagement activities have included running workshops at after school learning programs, providing first aid support at local sporting events, promoting physiotherapy at school careers forums and assisting in an Indigenous arts health program.

Outcome Measures: Student participation is recorded by the Community Engagement Team. Students are surveyed about their participation in community projects as part of their placement evaluation.

Results: Since 2012, 17 students completed 229 hours of community engagement across eight different activities. Students participated in most of the activities in their own time to minimise impact on their clinical experience. They reported that the activities were valuable enhancement to their clinical placement experience. Students described feeling more confident interacting with community groups including children and Indigenous people.

Conclusion: Physiotherapy students report community projects are a valuable learning experience Community activities are an alternative way of exposing students to different community groups that they will interact with in their careers.

Key Practice Points:
- Opportunities for community engagement are valued by physiotherapy student on clinical placement.
- Community activities provide valuable opportunity for student to interact with community groups they will work with in clinical practice.
- Community activities can be successfully integrated in to clinical placement without impacting on the clinical placement experience.

WHAT PROPORTION OF PEOPLE WITH HIP AND KNEE OSTEOARTHRITIS MEET PHYSICAL ACTIVITY GUIDELINES? A SYSTEMATIC REVIEW AND META-ANALYSIS

Mr Jason Wallis1,2, Dr Kate Webster2, Dr Pazit Levinger3, Prof Nicholas Taylor1,2
1Eastern Health 2La Trobe University 3Victoria University

Question: What proportion of people with hip and knee osteoarthritis meet physical activity guidelines?

Design: Systematic review with meta-analysis.

Participants: Hip and knee osteoarthritis.

Outcomes: Physical activity.
Results: Knee osteoarthritis: 21 studies involving 3,266 participants averaged 50 minutes per week (95% CI 46 to 55) of moderate to vigorous physical activity when measured in bouts of ≥ 10 minutes and 7,753 daily steps (95% CI 7,582 to 7,924). Proportion meta-analysis provided moderate quality evidence that 13% (95% CI 7 to 20) completed ≥ 150 minutes per week of moderate to vigorous physical activity in bouts of ≥ 10 minutes and low quality evidence that 19% (95% CI 8 to 33) completed ≥ 10,000 daily steps. Hip osteoarthritis: only 1 study reported physical activity in bouts: 11 studies involving 325 participants averaged 189 minutes per week (95% CI 166 to 212) of moderate to vigorous physical activity and 8,174 daily steps (95% CI 7,670 to 8,678). Proportion meta-analysis provided very low quality evidence that 58% (95% CI 18 to 92) completed ≥ 150 minutes per week of moderate to vigorous physical activity in absence of bout criterion and 8,174 daily steps (95% CI 7,670 to 8,678). Proportion meta-analysis provided very low quality evidence that 58% (95% CI 18 to 92) completed ≥ 150 minutes per week of moderate to vigorous physical activity in absence of bout criterion and 8,174 daily steps (95% CI 7,670 to 8,678).

Conclusion: A small to moderate proportion of people with knee and hip osteoarthritis meet current physical activity guidelines and recommended daily steps for adults. Future research should establish the effects of increasing physical activity in this population to meet the current guidelines.

Key Practice Points:
- A small proportion of people with hip/knee osteoarthritis meet current physical activity guidelines.
- People with hip/knee osteoarthritis may not be much less physically active than people without osteoarthritis.
- Strategies to increase physical activity for these people should address non disease-related factors, not solely focus on disease-related factors.

VALIDATION OF A SET OF CLINICAL IDENTIFIERS FOR THE EARLY STAGE OF PRIMARY/IDIOPATHIC ADHESIVE CAPSULITIS

Walsmsley S, Osmotherly PG, Rivett DA
School of Health Sciences, The University of Newcastle, Newcastle

Question: Are any of the clinical identifiers previously proposed by expert consensus for early stage idiopathic adhesive capsulitis valid?

Design: Cross-sectional study.

Participants: Sixty-four patients diagnosed with early stage adhesive capsulitis by a physiotherapist or medical practitioner.

Outcome Measures: Active and passive ranges of motion and associated visual analogue scale pain scores for eight shoulder movements were recorded prior to and immediately following an intra-articular injection of corticosteroid and local anaesthetic. Using response to the injection as the reference standard, pain relief of ≥ 70% for passive external rotation in adduction was deemed a positive response. The clinical identifiers were analysed in relation to the injection response using backward step-wise logistic regression.

Results: Sixteen (25%) participants demonstrated a positive response. Univariate logistic regression identified that of the proposed identifiers, global loss of passive range of movement (OR 0.26; p = 0.03), pain at the end of range of all measured active movements (OR 0.23; p = 0.02), and percentage loss of active movement with external rotation in 90 degrees abduction (OR 0.23; p = 0.02) were associated with a positive response. Following stepwise removal of the variables, pain at the end of range of all measured active movements remained the only identifier but was associated with a reduced odds of a positive response.

Conclusion: This study has been unable to validate any of the clinical identifiers for early stage adhesive capsulitis previously proposed by expert consensus. It suggests pain at the end of range of all measured active movements is unlikely to support a diagnosis of early stage adhesive capsulitis.

Key Practice Points:
- The clinical identifiers previously determined by expert consensus have not been validated.
- Pain at the end of range of all measured active shoulder movements is unlikely to support a diagnosis of early stage adhesive capsulitis.

MOVEMENT AND PAIN PATTERNS IN EARLY STAGE PRIMARY/IDIOPATHIC ADHESIVE CAPSULITIS

Walsmsley S, Osmotherly PG, Rivett DA
School of Health Sciences, The University of Newcastle, Newcastle

Question: Do patients with early stage primary/idiopathic adhesive capsulitis demonstrate any pattern of movement loss and associated pain that may facilitate diagnosis?

Design: Prospective observational study.

Participants: Fifty-two patients diagnosed with early stage adhesive capsulitis by a medical practitioner or physiotherapist.

Outcome Measures: Active and passive ranges were measured for eight shoulder movements. The pain level at the end of each movement was recorded, as well as the limiting factor to movement.

Results: Factor analysis determined a two factor structure for percentage loss of active movement with external rotation movements in neutral and 90 degrees abduction clearly demonstrating greater loss than non-rotational movements. A single factor was extracted for percentage loss of passive range of movement suggesting global loss of passive movement. Factor analysis identified pain at the end of active and passive ranges of movements generally behaves differently for rotational and non-rotational shoulder movements, although clear separation was not observed. The most painful active and passive movement, and the movement most frequently limited by pain rather than resistance, was external rotation in 90 degrees abduction.

Conclusion: This is the first study to investigate the presence of any movement and pain patterns that may exist in a group of patients diagnosed with early stage primary/idiopathic adhesive capsulitis. Although pain is reportedly a characteristic in the early stage, it appears less useful than percentage loss of active range of movement in identifying the disorder in this stage. These results may provide preliminary evidence to facilitate the early diagnosis of adhesive capsulitis.

Key Practice Points:
- Pain may be less useful than loss of active range in early diagnosis of adhesive capsulitis.
- Percentage loss of passive ranges of movement identified non-specific global loss.
- External rotation in 90 degrees abduction may be the most painful and passive movement in early stage adhesive capsulitis.

BRISK WALKING PROGRAMME WITHIN A RESIDENTIAL PAIN MANAGEMENT PROGRAMME IN CHRONIC PAIN POPULATION: A FEASIBILITY STUDY

Wang AP1, Harding VR2, Simmonds MJ3, JSmith JG4
1Neuroscience Australia Sydney NSW
2INPUT St Thomas’ Hospital London UK
3Physical Therapy, University of Texas USA
4St George’s University of London, London UK

Question: Does adding a brisk walking programme (BWP) to a 4-week residential cognitive-behavioural pain management programme (C-BPMP) enhance psychological and physical performance?

Design: Randomised controlled trial.

Participants: A convenience sample of 108 mixed chronic pain patients after discharge from 9 C-BPMPs were randomly allocated to experimental or control groups. Intervention The experimental group had C-BPMP plus a BWP protocol 3x a week, increasing from 2 to 5 repetitions of the WINGATE training protocol (7 to 14½ minutes) over 4 weeks. The control group had C-BPMP only.

Outcome Measures: A 5-minute walk (with velocity & cadence data obtained visually from the 3rd minute), 1-minute stand-ups, 1-minute stairs & Stroop test were assessed on the last day of treatment and at 1 month post treatment. Self-report measures of pain self-efficacy, catastrophising, depression and fear of activity were also obtained.
MOBILISATION DURING RENAL REPLACEMENT THERAPY VIA VASCATH IN PATIENTS WHO ARE CRITICALLY ILL IS SAFE AND FEASIBLE

Wang Y1,2, Ritchie P1, Walker C1, Ansell T1, Ryan DT1, Lim P1, Vij S1, Acs P1, Haines T1, Fealy N1, Skinner EH1,2,3
1Monash Medical Centre Clayton, Monash Health, Melbourne
2Dandenong Hospital, Monash Health, Melbourne
3Western Health, Melbourne
4Allied Health Research Unit, Monash Health, Melbourne
5Monash University, Melbourne
6Austin Hospital, Austin Health, Melbourne
7Frankston Hospital, Peninsula Health, Melbourne

Question: Is mobilisation in patients undergoing continuous renal replacement therapy via vascath in intensive care units safe? Does mobilisation in this population cause premature circuit failure?

Design: Prospective, longitudinal observational cohort study.

Participants: Nineteen control patients and 33 intervention patients in intensive care units at Monash Medical Centre and Dandenong Hospital on continuous renal replacement therapy via femoral, subclavian or internal jugular vascath. The study was approved by the Southern Health Human Research Ethics Committee.

Intervention: Participants undertook one of three movement interventions based on their level of alertness and physical function: passive bed exercises; sitting on the edge of the bed; or standing/marching on the spot.

Outcome Measures: Incidence of adverse events (e.g. catheter dislodgement, haematoma, bleeding), continuous renal replacement therapy filter life (hours) and pressure parameters.

Results: No occurrences of filter occlusion or failure were recorded during intervention in any participants. No adverse events were associated with intervention delivery or detected in post intervention follow-up. Intervention filters lasted longer. This difference was statistically significant for the femoral access filters mean (standard deviation) = 35.3 ± 17.6 versus 18.9 ± 14.3 (p = 0.001), but not for the non-femoral access filters 34.9 ± 17.4 versus 28.6 ± 20.8 (p = 0.36). The activated thromboplastin time, international normalised ratio and platelet count were similar between the femoral intervention and non-intervention groups.

Conclusion: Mobilisation whilst on CRRT via vascath appears to be safe and does not shorten filter life. Further multicentre studies are needed to confirm these findings.

Trial registration: ACTRN12611000733976

Key Practice Points:
- This is the first international study to report data on filter life and adverse events during mobilisation on renal replacement therapy via vascath in intensive care
- Mobilising these patients appears to be safe; does not result in adverse events; does not shorten and may even increase filter life.

THE EFFECT OF EXERCISE BASED MANAGEMENT FOR MULTIDIRECTIONAL INSTABILITY OF THE GLENOHUMERAL JOINT: A SYSTEMATIC REVIEW

Warby SA, Pizzari T, Ford J, Hahne AJ, Watson L
Department of Physiotherapy, Faculty of Health Sciences, La Trobe University, Melbourne

Question: What is the effect of exercise based management on outcomes of patients with glenohumeral multidirectional instability (MDI)? What is the structure of the exercise protocols, what outcomes are used and are there any adverse effects associated with exercise?

Design: Systematic review of all study designs except case reports and case series.

Participants: Patients with clinically diagnosed MDI with instability in at least two directions.

Intervention: Studies were included if at least one group with MDI received exercise based management.

Outcome Measures: Inclusion criteria were not limited by outcomes.

Results: Risk of bias was high in all seven included studies. GRADE assessment revealed very low quality evidence that surgery was favored over exercise for impairment outcomes only, and exercise was favored over surgery for patient focused outcomes. Before and after comparisons of exercise based management revealed very low quality evidence for improvements in outcomes. Downgrading of the evidence was primarily due to studies with a high level of bias, heterogeneity in participant samples, impairment based and nonspecific outcome measures and poor reporting of intervention parameters.

Conclusion: Despite the recommendation of exercise as the primary treatment for MDI, there is a lack of quality evidence to support one specific exercise protocol over another or to guide clinicians on the type of drills or dosages to use when treating MDI with exercise. There is a need for high quality intervention studies to be undertaken to validate the effect of exercise based management on functional and specific outcomes of patients with MDI.

Key Practice Points:
- The very low quality evidence in this field is due to studies of poor quality.
- Little evidence exists to guide clinicians on the type of drills or dosages to use when treating MDI with exercise.
- There is no evidence of one exercise protocol being superior to another.

A PILOT RANDOMIZED CROSSOVER TRIAL COMPARING THE EFFECT OF TWO EXERCISE PROGRAMS ON MULTIDIRECTIONAL INSTABILITY OF THE SHOULDER: RESEARCH PROTOCOL

Warby SA, Ford JJ, Pizzari T, Hahne AJ, Watson L
Department of Physiotherapy, Faculty of Health Sciences, La Trobe University, Melbourne

Question: What is the effect of the Lyn Watson exercise program compared with the Rockwood exercise program on outcomes of patients with glenohumeral multidirectional instability (MDI)?

Design: Randomised controlled cross-over trial with concealed allocation and participant blinding.

Participants: Participants aged between 12 and 35 years, with clinically diagnosed non-traumatic MDI, will be randomly allocated to either the Rockwood program or the Lyn Watson program. Both interventions will comprise 12 weekly physiotherapy sessions involving exercise prescription and progression of the intervention specific home program. Outcomes will be assessed at baseline, 6 and 12 weeks. Following the 12 week outcome measures, participants who measure less than a minimal detectable change on primary outcome measures will cross over into the alternative intervention for a subsequent 12 weeks.

Outcome Measures: Primary outcome measures will be the Melbourne Instability Shoulder Score (MISS) and the Western Ontario Shoulder Index (WOSI). Secondary outcomes will include a 7 point global rating of change score and satisfaction with physiotherapy treatment scale.
Results: Data will be analysed on a per protocol basis and intention to treat principles with linear mixed models for continuous outcomes and Mann Whitney U tests for ordinal outcomes. Discussion: This trial will compare outcomes for the Lyn Watson program and the Rockwood program, as well as between subject effects for exercise based management. It is hypothesized that the proposed research will assist in evidence based guidance for clinicians when treating MDI with exercise. Ethics Approval: Faculty of Human Ethics Committee, La Trobe University; FHEC12/201.

Key Practice Points:
- Despite recommendations of exercise as the primary treatment for MDI, no evidence exists for the efficacy of exercise for improving functional and instability specific outcomes.
- There is no evidence of one exercise protocol being superior to another.
- This research aims to establish guidelines for clinicians for treating MDI with exercise.

TARGETED STRATEGIES FOR THE FREQUENCY OF IDENTIFICATION AND REFERRAL OF THE PRE-DIABETIC PATIENT BY OUTPATIENT MUSCULOSKELETAL PHYSIOTHERAPISTS

Ware H, Sutton J, Skinner EH
Western Health, Melbourne

Question: Do targeted strategies improve the frequency of identification and referral of the pre-diabetic patient by outpatient musculoskeletal physiotherapists?

Design: A retrospective clinical record audit of all patients seen in musculoskeletal outpatients during two separate one month periods, pre and post intervention.

Participants: Five physiotherapists working in musculoskeletal outpatients at a tertiary hospital.

Intervention: The Physiotherapists’ participated in two educational sessions of one-hour duration which were designed to make them aware of the importance, impact and ease of screening musculoskeletal outpatients for pre-diabetes. They were provided with a kit for screening and educated on the available referral resources designed to prevent the transition to Diabetes Mellitus in the pre-diabetic patient.

Outcome Measures: Proportion of patients for whom screening or referral for pre-diabetes was documented in their outpatient physiotherapy clinical record.

Results: Pre-intervention audit data indicates that none of the patients seen in this setting were screened or referred for pre-diabetes. Post-intervention data will be collected in August 2013.

Conclusion: Audit evidence is that pre-diabetic screening is not occurring in this population. Simple education and resource provision may be an important aspect of pre-diabetes intervention. As primary contact practitioners, physiotherapists are well-placed to identify the pre-diabetic patient and provide educational and referral resources designed to prevent the progression to diabetes.

WORKING WITH PATIENTS AND TECHNOLOGY TO PROMOTE CLINICAL REASONING AND ASSESSMENT SKILLS IN STUDENT SEMINARS

Webster MJ, Remedios LJ, El-Ansary D
Physiotherapy Department, The University of Melbourne, Melbourne

Question: Can we facilitate students’ clinical reasoning using authentic patient interaction in pre-clinical classes?

Design: Action research using a closed cohort.

Participants: Doctor of Physiotherapy students, one patient, and two physiotherapy educators.

Intervention: Five x 2 hour seminars run in year 1, semester 1 of the program. Patients with common clinical conditions consented to being assessed by the students and an educator. Using a Navigated Approach to Patient Care reasoning framework card (NAV), students worked with the educator to complete a subjective assessment and physical examination. Another physiotherapy educator recorded assessment findings on the NAV card using Endnote file which was viewed on a big screen. Students could learn by observing an expert assess a patient, participate in the assessment, view the recording conventions of the profession and discussing clinical reasoning.

Outcome Measures: 101 students completed a questionnaire, rating their learning against the subject learning outcomes. Educator observations and patient feedback on the sessions were also used to triangulate data.

Results: Eight subject learning outcomes were rated highly with average scores ranging 7.26 – 8.20 out of 10. Qualitative data emphasised a broad range of learning opportunities.

Conclusion: This approach to early clinical reasoning was rated highly by students, patients and educators. It draws together the expertise of patients and educator as well as technology for more authentic clinical reasoning experiences prior to clinical placement.

Key Practice Points:
- Large group clinical reasoning seminars involving patient assessment allows students to engage with clinical reasoning early in their pre-clinical program.
- A navigation reasoning framework can provide an explicit clinical reasoning pathway.
- Demonstrating patient assessments, clinical reasoning and recording conventions are helpful for preparing students for clinical practice.

FATIGUE, PHYSICAL PERFORMANCE AND COMMUNITY AMBULATION IN STROKE SURVIVORS AT DISCHARGE FROM HOSPITAL AND ONE MONTH LATER

Weber JF,1,2 Jiang DH,3 Mahenderan N,1 Kuy S54,5,5 Brauer SG1
1Division of Physiotherapy, School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane
2Division of Physiotherapy, Royal Brisbane and Women's Hospital, Brisbane
1Griffith Health Institute, Griffith University, Gold Coast
2Allied Health Research Collaborative, The Prince Charles Hospital, Brisbane

Question: How many stroke survivors experience post-stroke fatigue at discharge from inpatient rehabilitation and at one month follow-up? What is the relationship between fatigue, functional ability and community ambulation at one month follow-up?

Design: Prospective longitudinal correlational study.

Participants: Eighteen stroke survivors in an inpatient rehabilitation setting.

Outcome Measures: Fatigue was measured using the Fatigue Severity Scale (FSS). Functional ability was assessed using the 6-minute walk test, 10m walk test and the Balance Outcome Measures for Elder Rehabilitation (BOOMER). Community ambulation (no. steps) was quantified using an accelerometer (ActivPAL) over four days.

Results: The mean age of participants was 71±15 years and 74% were male. Approximately one third of stroke survivors experienced fatigue (score > 4 on FSS) at baseline (33.3%) and at one month (36.4%). At discharge, fatigue severity was significantly associated with lower BOOMER scores (r = -0.628, p = 0.007), slower 10m walk speeds (r = -0.6, p = 0.01) and shorter distances covered in 6-minute walk tests (r = -0.564, p = 0.02). No significant associations were found between fatigue severity and participant characteristics or physical performance measures at one month (p > 0.05). Fatigue at discharge and one month was not associated with steps taken in the community.

Conclusion: Although no associations between fatigue and community ambulation were found, fatigue was associated with poorer balance, gait speeds and endurance all of which influence the ability to safely and successfully walk in the community.

Key Practice Points:
- Fatigue is associated with poorer outcomes on common clinical assessments conducted in an inpatient rehabilitation setting at discharge
- Fatigue should be considered as an important factor in the rehabilitation process and return to the community
- Fatigue does not appear to be associated with objective community ambulation measures
THE EFFECT OF FATIGUE ON SINGLE-LEG SQUAT KINEMATICS IN HEALTHY, YOUNG ADULTS

**Weeks BK**, **Carty CP**, **Watson SL**, **Young BM**, and **Horan SA**

1 School of Rehabilitation Sciences, Griffith University, Gold Coast
2 Centre for Musculoskeletal Research, Griffith Health Institute, Gold Coast
3 Queensland Children’s Gait Laboratory, Royal Brisbane and Women’s Hospital, Brisbane

**Question:** What is the effect of fatigue on single-leg squat kinematics in healthy, young adults?

**Design:** Pre-test post-test.

**Participants:** 60 healthy young men and women (25.3 ± 4.3 years).

**Intervention:** A general fatigue protocol was initiated, whereby each participant performed sets of alternate lunges. A maximal vertical jump was performed after each set in order to monitor decay in jump performance. Twenty repetitions of lunges were performed for the initial three sets before incrementing by an additional 10 lunges for every set thereafter up to fatigue.

**Outcome Measures:** Three-dimensional kinematic data were collected during single-leg squats using VICON motion analysis before and after the fatiguing exercise regime.

**Results:** The response to fatigue was an increase in trunk flexion (24.5 ± 13.7 vs. 29.8 ± 11.8 degrees, p = 0.001), lateral flexion (-7.0 ± 3.9 vs. -9.3 ± 13.0 degrees, p = 0.03) and rotation (-6.8 ± 5.7 vs. 10.1 ± 7.9 degrees, p = 0.001), an increase in pelvic tilt (30.4 ± 10.8 vs. 31.8 ± 8.7, p = 0.05), obliquity (-5.2 ± 3.3 vs. -19.6 ± 9.9 degrees, p = 0.001) and rotation (-4.0 ± 3.0 vs. -5.4 ± 5.0 degrees, p = 0.04), and an increase in hip flexion (69.8 ± 17.5 vs. 73.3 ± 14.1 degrees, p = 0.007) and adduction range (15.2 ± 16.6 vs. 16.9 ± 6.4 degrees, p = 0.04). There was no effect of sex on the single-leg squat kinematic response to fatigue (p = 0.41).

**Conclusion:** Fatiguing exercise results in kinematic changes at the trunk and pelvis, but not the knee. The effect appears to be independent of sex.

**Key Practice Points:**
- The trunk may have a role in modulating lower limb stability in the fatigued state
- The kinematic response to fatiguing exercise appears to be similar between sexes
- Trunk movement patterns should not be overlooked when assessing the single-leg squat

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THE EFFECT OF ANKLE BRACING ON KNEE KINETICS AND KINEMATICS DURING VOLLEYBALL SPECIFIC TASKS

**Ng L** and **Campbell A**

1 School of Physiotherapy, Curtin Health Innovation Research Institute, Curtin University, Perth

**Question:** Does ankle bracing alter knee kinetics and kinematics during volleyball skills?

**Design:** Repeated measures study design.

**Participants:** Fifteen elite female volleyball players.

**Intervention:** Participants performed a series of straight-line and lateral volleyball tasks with no brace and when wearing the Active Ankle T2 Brace (Cramer Products, Inc, Gardner, KS). A 14-camera Vicon motion analysis system and AMTI force plate were used to capture the kinetic and kinematic data.

**Outcome Measures:** Knee range of motion and peak knee anterior-posterior and mediolateral shear forces occurring between initial contact with the force plate and toe off were compared using paired sample t-tests between the brace and no-brace conditions (p < .05).

**Results:** The results revealed no significant effect of bracing on knee kinematics during any task or on knee kinetics during the straight-line movement volleyball tasks (p > 0.05). However, ankle bracing was demonstrated to reduce knee lateral shear forces during all of the lateral movement volleyball tasks; cutting (p = 0.025), block and push off (p = 0.004) and spike and cover (p = 0.016).

**Conclusion:** Wearing the Active Ankle T2 brace appears to reduce shear loading at the knee joint during volleyball tasks and therefore may be a method of reducing the high rate of knee overuse injuries in this population.

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THE RELATIONSHIP OF PHYSICAL AND PSYCHOSOCIAL IMPAIRMENTS TO STAIR CLIMBING ABILITY IN PATIENTS FOLLOWING TOTAL KNEE ARTHROPLASTY

**Whitchelo T**, **McClelland J**, **Webster K**, **Jillian Feller J**, and **Whitehead T**

1 Department of Physiotherapy, School of Allied Health, La Trobe University, Australia
2 OrthoSport Victoria, Epworth Richmond

**Question:** What are the impairments contributing to stair climbing ability in patients 12 months post total knee arthroplasty?

**Design:** Cross-sectional study.

**Participants:** Forty one participants at least 12 months post total knee arthroplasty.

**Outcome Measures:** Stair climbing ability (time taken to ascend and descend a flight of stairs), isometric strength of the quadriceps and hip abductor muscles, balance (single limb stance time), pain (Visual Analog Scale), and self-efficacy (perceived ability to climb stairs).

**Results:** Greater self-efficacy, stronger lower limb muscles and longer balance were each significantly correlated with faster stair climbing time. There was no relationship between age, body mass index, pain and stair-climbing. The linear model that included self-efficacy, quadriceps strength, balance and hip abductor strength explained 47% of the variance in stair climbing (p<0.001). Self-efficacy alone explained 36% of the variance (p<0.001).

**Conclusion:** As expected, greater strength of the hip abductors and quadriceps, and longer single limb stance time were associated with faster stair-climbing in patients 12 months after TKA. Most post-operative rehabilitation programs focus on improving quadriceps strength, however these findings support the inclusion of strategies that address multiple impairments including hip abductor strength and balance to facilitate greater stair-climbing ability. The moderate relationship between stair-climbing and self-efficacy suggests that patients may adequately perceive their own ability to climb stairs.

**Key Practice Points:**
- Many factors are related to stair climbing ability in patients post TKA, including both physical and psychosocial factors.
- Rehabilitation that addresses multiple impairments may be more conducive to maximising stair climbing ability.
- Further research is required to investigate the effectiveness of improving self-efficacy in post-operative rehabilitation.
STRENGTH TRAINING FOR WALKING IN NEUROLOGICAL REHABILITATION IS NOT TASK-SPECIFIC: A SYSTEMATIC REVIEW

Williams G1,2, Kahn M3, Randall4
1 Epworth Hospital, Melbourne
2 The University of Melbourne. Melbourne
3 Northern Health, Melbourne

Question: Muscle weakness is prevalent and often the primary impairment for many people with neurological conditions. The last 10-15 years has seen a proliferation in studies investigating the efficacy of strength training to improve walking. Despite many studies demonstrating that strength training is safe and efficacious for improving muscle weakness, few studies have reported improved walking outcomes as a result of greater leg strength. The primary question for this systematic review was to investigate whether strength training programs for walking in neurological rehabilitation are task-specific?

Design: Systematic review with data synthesised in a narrative form.

Results: The search identified 25 randomised controlled trials which investigated the efficacy of strength training to improve walking in people with a variety of neurological conditions. Results revealed that despite significant strength gains, many studies failed to show a significant improvement in walking capacity. Most studies did not include exercises relating to all three main power events important for walking. Strength testing and strengthening exercises were prioritized for the knee extensors and flexors, despite their relatively minor role in human walking.

Conclusion: Strengthening exercises performed in the neurological population are not specific to the main muscle groups responsible for the power generation required for walking. There is a predisposition for strength testing and strengthening exercises to focus on the knee flexors and extendors despite their relatively minor role during walking. Further consideration of the specificity of strength training may provide greater translation of strength gains to improved walking outcomes.

Key practice points:
- Strengthening exercises need to be specific to the functional task
- The main power generators for walking need to be prioritized for strengthening
- Strength testing also needs to target the main power generators for walking

CLASSIFICATION OF GAIT DISORDERS FOLLOWING TRAUMATIC BRAIN INJURY

Williams G1,2, Lai D3, Schache A4, Morris ME5
1 Epworth Hospital, Melbourne
2 The University of Melbourne. Melbourne
3 Victoria University, Melbourne
4 La Trobe University, Melbourne

Question: Can gait disorders resulting from traumatic brain injury (TBI) be classified into clinically relevant and distinct sub-groups?

Design: Cross-sectional cohort study comprising people with TBI receiving physiotherapy for mobility limitations.

Participants: One hundred and two people with TBI.

Intervention: N/A.

Outcome Measures: The taxonomic framework for gait disorders following TBI was devised based on a framework previously developed for people with cerebral palsy. Participants with TBI who were receiving therapy for mobility problems were assessed using three-dimensional gait analysis. Pelvis and bilateral lower-limb kinematic data were recorded using a VICON motion analysis system while each participant walked at a self-selected speed. Five trials of data were collected for each participant. Multi-class support vector machine (SVM) models were developed to systematically and automatically ascertain the clinical classification.

Results: The statistical features derived from the major joint angles from unaffected limbs contributed to the best classification accuracy of 82.35% (on average 84 out of the 102 subjects). Features from the affected limb resulted in a classification accuracy of 76.47% (on average 78 out of 102 subjects).

Conclusions: Despite considerable variability in gait disorders following TBI, we were able to generate a valid and sensitive clinical classification system based on six distinct sub-groups of gait deviations. Statistical features related to the motion of the pelvis, hip, knee and ankle on the less-affected leg were able to accurately classify 82% of people with TBI-related gait disorders using a multiclass SVM framework.

Key practice points:
- TBI related gait disorders can be classified into clinically meaningful sub-groups
- Classification works best when based on the less-affected lower limb
- This taxonomic framework may be used to inform clinical decision making

RUNNING ABNORMALITIES AFTER TRAUMATIC BRAIN INJURY

Williams G1,2, Schache A3, Morris ME3
1 Epworth Hospital, Melbourne
2 The University of Melbourne. Melbourne
3 La Trobe University

Question: What is the type and incidence of running abnormalities following TBI when compared to a group of healthy controls (HC), and are these abnormalities similar to those which are present during self-selected walking?

Design: A convenience sample of

Participants: 44 people with TBI receiving therapy for mobility limitations, and a sample of 15 healthy controls (HCS).

Intervention: N/A.

Outcome Measures: Descriptive statistics.

Results: Spatio-temporal, kinematic and kinetic data at self-selected walking and running speeds were collected. People with TBI ran at significantly slower self-selected speeds than HCs. At matched running speeds, people with TBI used a higher cadence and shorter step length. The most commonly observed biomechanical abnormalities occurred at the knee during stance phase. Few trunk, pelvic or hip abnormalities were detected. Ankle power generation at push-off was significantly reduced whereas hip extensor power generation at initial contact was significantly increased.

Conclusion: Many people with TBI may actually be capable of running despite the presence of significant biomechanical abnormalities during gait. A stable trunk may be an important requirement for people following TBI to achieve running.

Key practice points:
- People with TBI use a high cadence/short stride length pattern
- Runners have few trunk and pelvic abnormalities
- Reduced distal power generation was compensated for by the hip extensors

DOES BALANCE STRATEGY TRAINING IMPROVE FUNCTION IN PEOPLE WITH MYASTHENIA GRAVIS?

Wong SH1, Nitz JC1, Williams KL1, Brauer SG2
1 Division of Physiotherapy, School of Health & Rehabilitation Sciences, University of Queensland, St. Lucia, Brisbane, Queensland, Australia

Questions: Are there improvements in gait speed, endurance, the ability to dual task and balance in people with Myasthenia Gravis in the measurement of disease severity after undertaking rehabilitation using balance strategy training?

Design: Case study series.

Participants: Seven people with stable Myasthenia Gravis participated in a 16-session workstation intervention using balance strategy training.
Outcome Measures: Myasthenia Gravis was quantified using the Quantitative Myasthenia Gravis Score. The overall score ranging from 0 to 39, with higher scores indicating greater disease severity or poorer muscle function. Gait endurance (6-minute walk test), functional speed, anticipatory reactions and dual task ability (Timed Up and Go Test + manual and cognitive) and center of pressure sway velocity balance (feet-apart eyes closed on foam) were assessed pre and post intervention. Demographics included years since diagnosis of Myasthenia Gravis, body parts affected, type and number of medications and medical history. A mean improvement of at least 15% was selected to determine clinically significant results. This criterion had been used in various single-subject research involving patients with neurological disorders.

Results: The Quantitative Myasthenia Gravis Score, Timed Up and Go Test – cognitive and feet-apart eyes closed on foam achieved clinically significant improvements of 28.6, 17.2 and 28.6% respectively, with sustained or continued improvements. No adverse effects were reported.

Conclusion: Balance strategy training is an effective and safe intervention for people with Myasthenia Gravis to improve their physical functioning, balance and disease state without causing any adverse effects.

Key Practice Point
• Balance strategy training is an effective rehabilitation tool to improve function in people with Myasthenia Gravis.
• The Quantitative Myasthenia Gravis Score and the feet-apart eyes closed on foam balance measure demonstrated the greatest change with continued improvement at follow-up.

DO GAIT AND BALANCE DIFFER ACROSS DISEASE STEPS IN PEOPLE WITH MULTIPLE SCLEROSIS?

Williams KL1, Low Choy NL2, Brauer SG1

1Division of Physiotherapy, School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane
2Australian Catholic University, Brisbane

Questions: Are there differences in gait endurance, speed, balance and demographics in people with Multiple Sclerosis (MS) across the Disease Step Rating Scale? Are these parameters associated?

Design: A cross-sectional, observational study.

Participants: People with MS (n = 222) able to walk with/without an aid were assessed by a physiotherapist.

Outcome Measures: Disease severity was categorised using the Disease Step Rating Scale (0 = No change observed to 5.6 = severe difficulty walking). Gait endurance (6-minute walk test), speed (10m walk test; 25ft walk test; Timed Up and Go Test) and balance (Berg Balance Scale) were assessed and compared across Disease Steps. Demographics included years since diagnosis, age, gender, type of MS, walking aid and immunotherapy.

Results: The 6-minute walk test and Berg Balance Scale demonstrated significantly reduced scores across more Disease Steps (p < 0.001) than other walking tests. The 6-minute walk test better differentiated lower categories of the Disease Step Rating Scale (higher functioning people), while the Berg Balance Scale showed a progressive decline in balance across the Disease Step categories. The 10m and 25ft walk tests demonstrated significantly reduced walk speeds in higher categories that represented people with more severe disease progression and reduced walking ability (p < 0.001). The severity of MS was highly associated with reduced walk distance, slower walking speed and reduced balance (r(ho > 0.7, p < 0.001)

Conclusion: The Disease Step Rating Scale is a simple observational tool that allows health professionals to categorise the impact of MS on balance and mobility.

Key Practice Point
• The Disease Step Rating Scale tool categorises people with MS.
• The 6-minute walk test discriminates higher functioning people, the Berg Balance Scale shows progressive decline and 10m walk tests differentiate lower functioning people with MS.
• These results assist physiotherapists to choose appropriate measures for people with MS.

SENSATION OF BREATHLESSNESS: ASSOCIATIONS BETWEEN SEVERITY OF IMPAIRMENT, THE DYSPNOEA-12 AND THE MULTIDIMENSIONAL DYSPNOEA PROFILE

Williams MT1,2, Lowe L.3,4, Lewithwaite H3, Wiles L.3,4 Caffarella P1, Frith P4

1School of Population Health, University of South Australia, Adelaide
2Nutritional Physiology Research Centre, School of Health Science, University of South Australia, Adelaide
3Health and Use of Time (HUT) Group, School of Health Science, University of South Australia, Adelaide
4Department of Respiratory Medicine, Repatriation General Hospital, Adelaide

Questions: How well do scores from sensation of breathlessness instruments correlate with measures of respiratory impairment?

Design: Descriptive cross-sectional.

Participants: People with chronic obstructive pulmonary disease.

Outcome Measures: Associations between the Dyssnoea-12 (total score includes sensory quality and affective response) and the Multidimensional Dyspnoea Profile (separate scores for the intensity of unpleasantness, sensory quality, secondary affective response) were compared with forced expiratory volume per cent predicted [FEV1%pred], six minute walk distance, Chronic Respiratory Disease questionnaire and Hospital Anxiety and Depression scores using Pearson’s correlation coefficient with p < 0.05 accepted as significant.

Results: In this group of 74 people with moderate to severe airways obstruction (71 ± 9 years, 36 Female, mean FEV1 % predicted 50 ±17), preliminary analysis of scores for both instruments indicate significant correlations. This conclusion stems from the Chronic Respiratory Disease questionnaire (r = 0.65 to 0.37, p < 0.0001), Anxiety (r = 0.27 to 0.48, p < 0.01) and Depression scores (r = 0.27 to 0.33 p < 0.002). Distance walked was significantly associated with intensity of unpleasantness (r = -0.35, p < 0.0001) and secondary affective response (r = 0.20, p < 0.04) but not intensity of sensory quality or total score for the Dyspnoea-12 (r = 0.01). Distance walked was not predicted FEV1%pred, was significantly associated only with intensity of unpleasantness (r = -0.30, p < 0.006).

Conclusion: Specific instruments exist for assessing the sensation of breathlessness. Domain of sensation especially the degree of perceived unpleasantness and secondary affective responses are strongly associated with severity of impairment.
RELIABILITY AND VALIDITY OF THE MULTIMEDIA ACTIVITY RECALL IN CHILDREN AND ADULTS IN PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Hunt T1,2, Williams MT1,4, Olds T1
1 Health and Use of Time (HUT) Group, University of South Australia, Adelaide
2 Respiratory Clinical Research Unit, Repatriation General Hospital, Adelaide
3 School of Population Health, University of South Australia, Adelaide
4 Nutritional Physiology Research Centre, University of South Australia, Adelaide

Question: Does a 24-hour activity recall instrument provide valid and reliable assessments of use of time and energy expenditure in people with chronic obstructive pulmonary disease and their carers?

Design: Reliability and validity study.

Participants: Twenty-four couples (People with chronic obstructive pulmonary disease; age 74.4 ± 7.9 yrs, FEV1 54 ± 13 %, Carer; age 69.6 ± 10.9 yrs, FEV1 99 ± 24 %).

Intervention: Time use was assessed using computer-assisted telephone interviews (Multimedia Activity Recall for Children and Adults) across life domains (e.g. sleep, self-care, physical activity). Participants completed four, 24-hour activity recalls (including test-retest of two days) while wearing triaxial accelerometers (Actigraph GT3X+), multi-sensor armbands (Sensewear Pro3®) and pedometers (NewLifestyles 1000®).

Outcome Measures: Test-retest reliability was quantified for major activity recall domains and various energy expenditure zones. Validity assessments between recalled physical activity levels, moderate to vigorous physical activity duration and related activity monitoring data were conducted using intra-class correlation coefficients, Bland-Altman analyses, paired t-tests and Spearman’s rank correlation coefficients.

Results: Test-retest reliability for each activity recall domain was high, with intra-class correlation coefficients consistently greater than 0.9. Validity coefficients were moderate to strong (r = 0.43 – 0.80) across all comparisons. Compared to accelerometry, the Multimedia Recall for Children and Adults provided comparable estimates for physical activity levels and slightly higher estimates of moderate to vigorous physical activity.

Conclusion: The Multimedia Activity Recall for Children and Adults is a valid and reliable instrument for capturing energy expenditure and use of time data in this population.

Key Practice Points:
- Increasing evidence links time use with health outcomes.
- Activity-related research in this population is of increasing interest, however no validated activity recall instruments exist.
- We confirm this activity recall instrument as valid and reliable, with the ability to provide point in time assessments of time use outcomes.

DIFFERENCES IN OUTCOMES FOR CLINICAL DIAGNOSTIC GROUPS UNDERTAKING AN INPATIENT REHABILITATION PROGRAM

Williams R1, Morrison G1, Woodhead V1,2, Low Choy N1,2
1 The Prince Charles Hospital
2 Australian Catholic University (McAuley Campus), Banya, Queensland, Australia

Questions: Are there differences in function, balance and mobility outcomes for diagnostic groups undertaking inpatient rehabilitation?

Design: Prospective observational study.

Participants: Rehabilitation inpatients (n = 163) at The Prince Charles Hospital in 2011 and 2012 were assessed at discharge and categorised by diagnosis (stroke, frailty, ortho-geriatric).

Interventions: Tailored interventions.

Outcome Measures: Function (Functional Independence Measure), balance (step test, functional reach) and mobility measures (10m walk test, timed up and go test, six-minute walk test).

Reliability and validity study.

Participants: Twenty-four couples (People with chronic obstructive pulmonary disease; age 74.4 ± 7.9 yrs, FEV1 54 ± 13 %, Carer; age 69.6 ± 10.9 yrs, FEV1 99 ± 24 %).

Intervention: Time use was assessed using computer-assisted telephone interviews (Multimedia Activity Recall for Children and Adults) across life domains (e.g. sleep, self-care, physical activity). Participants completed four, 24-hour activity recalls (including test-retest of two days) while wearing triaxial accelerometers (Actigraph GT3X+), multi-sensor armbands (Sensewear Pro3®) and pedometers (NewLifestyles 1000®).

Outcome Measures: Test-retest reliability was quantified for major activity recall domains and various energy expenditure zones. Validity assessments between recalled physical activity levels, moderate to vigorous physical activity duration and related activity monitoring data were conducted using intra-class correlation coefficients, Bland-Altman analyses, paired t-tests and Spearman’s rank correlation coefficients.

Results: Test-retest reliability for each activity recall domain was high, with intra-class correlation coefficients consistently greater than 0.9. Validity coefficients were moderate to strong (r = 0.43 – 0.80) across all comparisons. Compared to accelerometry, the Multimedia Recall for Children and Adults provided comparable estimates for physical activity levels and slightly higher estimates of moderate to vigorous physical activity.

Conclusion: The Multimedia Activity Recall for Children and Adults is a valid and reliable instrument for capturing energy expenditure and use of time data in this population.

Key Practice Points:
- Increasing evidence links time use with health outcomes.
- Activity-related research in this population is of increasing interest, however no validated activity recall instruments exist.
- We confirm this activity recall instrument as valid and reliable, with the ability to provide point in time assessments of time use outcomes.
Results: Outcomes between years did not differ with data pooled. There were no significant between group differences in function at discharge (p > 0.05). The ortho-geriatric group completed fewer steps (p < 0.001) and reached shorter distances (p = 0.005) compared to the stroke group. Timed up and go test times revealed slower walk speeds for the ortho-geriatric group compared to stroke (p = 0.004) and frailty groups (p = 0.003). 10m walk velocity for the orthopaedic group was slower at comfortable (p = 0.002) and fast paces (p < 0.001) than the stroke group and trended slower than the frailty group. Endurance (distance walked) of the ortho-geriatric (p = 0.001) and frailty (p = 0.019) groups was less than the stroke group. Both groups trended older (p = 0.079-0.046) and had shorter rehabilitation periods (p < 0.05) than the stroke patients.

Conclusion: Balance and mobility at discharge was reduced for all patients compared to normative data supporting follow-up in community. The ortho-geriatric group in particular require attention to manage their return to the community.

Key Practice Points:
• Outcomes demonstrate the need for ongoing rehabilitation following an inpatient stay particularly given the impetus for early discharge from hospital
• Careful consideration needs to be given to normative data to guide progress
• Attention to the factors impeding balance and mobility performance for the ortho-geriatric group is warranted.

Key Practice Points:
• Ultrasound imaging can be used to reliably measure abdominal and lumbar multifidus muscles in older adults.
• Measurements of images on different days, or by different experienced raters, can be performed reliably.
• These reliability results suggest that ultrasound imaging can be utilised in further clinical and epidemiological research within this age group.
INVESTIGATION OF TEST-RETEST RELIABILITY AND POSSIBLE LEARNING EFFECT IN THE SIX MINUTE WALK TEST IN A TRANSTIBIAL AMPUTE POPULATION

Wilson N1, Curtis H2, Chou M3, Holland A4
1Physiotherapy Department Caulfield Hospital
2School of Physiotherapy La Trobe University
3Amputee Unit Caulfield Hospital
4Physiotherapy Department Alfred Hospital

Questions: Is a learning effect evident when using the six minute walk test in a transtibial amputee population? Does cause of amputation effect impact on the presence of any learning effect? Is good test-retest reliability evident for the six minute walk test in this population?

Design: Within subjects repeated measures.

Participants: 19 medical/vascular and 6 trauma patients post transtibial amputations that have completed prosthetic rehabilitation.

Outcome Measures: Six minute walk test completed twice by all participants on the same day with 30-minute rest between attempts.

Results: Assessment of all patients on the six minute walk test 1 produced a mean distance of 331.2m (s.d. 114.5). Test 2 produced a mean of 334.8m (s.d. 138.7). A paired sample t-test demonstrated no significant difference between test 1 and test 2 (p = 0.67). The ICC score shows high test-retest reliability (p = 0.95, 95% CI 0.87-0.98). On a Bland-Altman plot a small difference was noted (mean 3.6m, s.d. 4.23m, limits of agreement -29.5m to 36.7m). Regression analysis comparing performance between the medical/vascular and trauma patients showed that a significant effect of learning was found in the trauma patients that could not be accounted for based on a greater baseline walk distance.

Conclusion: Overall results show that the test has high re-test reliability with no overall learning effect. However, separating participants by cause of amputation shows that those post trauma do in fact demonstrate a learning effect. The relatively small sample size used for the regression analysis should be noted.

Key Practice Points:
- 6 minute walk test has very good test re-test reliability in transtibial amputees
- Patients with transtibial amputations caused by medical/vascular events tend to do worse when re-attempting a 6 minute walk on the same day and no learning effect is evident
- Patients with amputations post traumatic injury tend to do better when retested on the six minute walk test and results suggest a learning effect is evident.

BUILDING CAPACITY AND LEADERSHIP IN PHYSIOTHERAPY RESEARCH: THE TASMANIAN PHYSIOTHERAPY RESEARCH GROUP

Winzenberg T1, Callisaya M2, Hides J3
1Menzies Research Institute, University of Tasmania, Hobart
2Monash University, Melbourne
3School of Physiotherapy, Australian Catholic University, Brisbane

Questions: Can physiotherapy research capacity be built in a regional area lacking an academic physiotherapy environment?

Design: Tasmania has a single university without a school of physiotherapy. Anecdotally, this has resulted in a sense of academic isolation for Tasmanian physiotherapists and in physiotherapy researchers interested in research pursuing higher degrees at other institutions. We developed a physiotherapy research group building program to address this, which included: building physiotherapy-relevant projects into existing research programs and offering them to potential students; developing a major collaboration with the Australian Catholic University to provide the content expertise to support these projects; forming the Tasmanian Physiotherapy Research Group and holding free seminars with visiting and local physiotherapy researchers to engage with the local physiotherapy community; establishing the Research Foundations program with the Australian Catholic University to support student and staff exchanges between institutions.

Participants: Tasmanian physiotherapists and researchers with an interest in physiotherapy-related research.

Outcome Measures: Numbers of Tasmanian Physiotherapy Research Group members, engagement activities held, new research higher degree enrolments by physiotherapists and new collaborative activities.

Results: Over three years, we completed a major cohort study and a randomised controlled trial on physiotherapy topics which support two students, with a third student undertaking a student initiated project. We have formed 2 national and an international collaboration. We have held three successful seminars and grown research group membership to 29.

Conclusion: This program shows that with a multifaceted approach it is possible to provide academic support to physiotherapists in areas distant from academic physiotherapy centres.

Key Practice Points:
- Absence of academic support may be a barrier to building physiotherapy research capacity in regional areas
- It is possible to overcome this barrier with a multifaceted approach
- Critical components appear to be focused efforts at building healthy collaborations and engaging with the local physiotherapy community

GAIT TRAINING WITH RHYTHMIC AUDITORY CUES TO INCREASE SPEED AND REDUCE GAIT VARIABILITY IN ALZHEIMER’S DISEASE - A PILOT STUDY

Wittwer JE1, Webster KE2, Hill KD3
1School of Allied Health, Faculty of Health Sciences, La Trobe University, Bundoora
2School of Physiotherapy, Faculty of Health Sciences, Curtin University, Perth

Question: Is a gait training program using rhythmic auditory cues feasible, acceptable and effective in improving spatiotemporal gait measures and reducing gait variability in people with mild to moderate Alzheimer’s disease (AD)?

Design: Within-participant experimental pilot study.

Participants: Four (1 F, median age = 81.2 yrs, median MMSE = 25, median time since diagnosis = 6s wks) community-dwelling adults with probable AD.

Intervention: Participants undertook nine home-visit based, progressively modified gait training sessions of 45 minutes’ duration over three weeks, which incorporated rhythmic auditory cues at systematically manipulated frequencies and a range of gait activities.

Outcome Measures: Spatiotemporal gait measures and gait variability (coefficient of variation (CV)) under four conditions (self-selected comfortable pace, motor dual-task, synchronised to each of music and metronome cues) measured immediately before, after and one month following the intervention.

Participant satisfaction questionnaire completed at immediate follow-up.

Results: Following training three participants walked faster under motor dual-task conditions (velocity change baseline to immediate follow-up range: 12.6–17.4 cm/s) and all four participants reduced velocity variability under single (CV change baseline to immediate follow-up range: 0.2–1.2%) and dual–task (CV change baseline to immediate follow-up range: 0.1–6%) conditions. Total satisfaction questionnaire scores ranged from 46–52 out of 55, indicating high satisfaction with the training program.

Conclusion: A home-visit based, progressively modified gait training program using rhythmic auditory cues was both feasible and effective in reducing gait variability especially under dual-task conditions in four participants with AD. These preliminary findings warrant further investigation in a larger randomised controlled trial.

Key Practice Points:
- A gait training program using rhythmic music and metronome cues may be feasible and acceptable for people with mild Alzheimer’s disease
- Practice of cued walking may reduce gait variability which is strongly related to falls risk in this group
- Gait change following cued training may be more clearly evident under dual task conditions
GENDER INFLUENCE ON PHYSICAL FUNCTIONING AND RECOVERY AMONG OLDER PEOPLE AFTER HIP FRACTURE

Woodward LM1,2, Sherrington C1, Clemson L1,2, Moseley AM1, Lord SR1, Cameron ID2
1Faculty of Health Sciences, University of Sydney
2The George Institute for Global Health, University of Sydney

Questions: Does gender influence physical functioning and recovery among older people after hip fracture? Does cognition alter the impact of gender?

Design: Secondary analysis of clinical trial data.

Participants: One hundred and sixty older people (30 men and 130 women) after hip fracture recruited during inpatient rehabilitation.

Outcome Measures: Knee extensor strength (spring balance, primary measure), six metre walking speed (stop watch, primary measure), physical performance measures (maximum balance range, step test, body sway, lateral stability, and coordinated stability), self-reported scales (Barthel, strength, balance, mobility, pain, and modified falls efficacy scale). Measures were undertaken at baseline and after four and 16 weeks of an exercise program.

Results: There were no significant gender differences at baseline. At week four, men performed better in tests of knee extensor strength (between-gender difference 2.1 kg, 95% CI 0.52 to 3.7, p = 0.008) and co-ordinated stability (-10.0 error score, 95% CI -17.6 to -2.4, p = 0.010). These differences remained after adjusting for baseline values. At week 16, differences were smaller and only statistically significant for co-ordinated stability (-10.2 error score, 95% CI -18.4 to -1.9, p = 0.016). Impaired cognition had a significant negative impact on co-ordinated stability but not on strength. The impact of gender on strength and co-ordinated stability persisted after adjusting for cognition.

Conclusion: No gender differences were seen at baseline. Men performed better in tests of strength and co-ordinated stability at four weeks after adjusting for baseline values, suggesting faster recovery. Fewer differences were observed at 16 weeks.

Key Practice Points:
• On trial entry, no gender differences were seen in people undergoing high intensity rehabilitation.
• Men undertaking exercise programs appeared to recover more quickly than women but this difference was less evident at 16 weeks than at four weeks.
• More gender-based research is needed in this field.

OUTCOME MEASURES: SELF-EFFICACY QUESTIONNAIRES, E-LEARNING ACCESS, LEARNING REACTIONNAIRE, QUALITATIVE FEEDBACK.

RESULTS: 320 individuals have undertaken the e-learning package; all RCH physiotherapists and acute staff at two regional centres have completed annual competencies. This model of education matched individual learning styles compared with traditional lecture model (95% CI 0.06 to 0.55, p = 0.01); self-efficacy scores indicated increased confidence in planning and preparing treatment.

Conclusion: This model provides a coordinated and cost-effective approach to acute paediatric physiotherapy education. It presents an opportunity to standardise clinical experience for physiotherapists across Queensland in line with Australian Standards for Physiotherapy.

Program supported by HWA.

Key Practice Points:
• This innovative model of simulated learning provides a standardised clinical experience in acute paediatric care for students and workforce across Queensland, with potential for widespread application.
• Technology-enhanced learning increases exposure to acute paediatric physiotherapy.
• This model provides an effective and safe environment for training and assessing technical and non-technical skills.

THE USE OF SIMULATED LEARNING TO ENHANCE CARDIORESPIRATORY ACUTE PAEDIATRIC PHYSIOTHERAPY

Wright S1, Mandrusiak A1, Ramsbotham N1, Hayles E1, Kelly K1
1Physiotherapy Department, Royal Children’s Hospital (RCH), Brisbane
2Division of Physiotherapy, School of Health and Rehabilitation Sciences, The University of Queensland (UQ), Brisbane
3Physiotherapy Department, The Townsville Hospital, Townsville
4Physiotherapy Department, Mackay Base Hospital, Mackay

Question: How to provide consistent and effective acute paediatric physiotherapy education ensuring standards of care are met across the continuum?

Method: Traditional methods of education of ‘see-one-do-one’ cannot be standardised and often are not undertaken due to timing, staffing pressures and patient acuity, with ramifications for safety and quality of care. Standardised children/infants pose ethical dilemmas and logistical challenges. Technology-enhanced learning can provide potential solutions to these issues if developed to best practice. Simulation sessions were delivered in collaboration with universities and hospital state-wide providing exposure to this unique environment. A constructivist model of education was introduced, scaffolding to authentic clinical experience using simulated learning tools that build from e-learning (theory and case studies) to simulated scenarios. Best practise and current evidence, supported by subject matter experts, were embedded into scenarios and structured around non-technical skills.

Participants: Physiotherapy students at UQ and subsequently two other universities; workforce at tertiary and regional centres across Queensland.

Outcome Measures: Self-efficacy questionnaires, e-learning access, learning reactionnaire, qualitative feedback.

Results: 320 individuals have undertaken the e-learning package; all RCH physiotherapists and acute staff at two regional centres have completed annual competencies. This model of education matched individual learning styles compared with traditional lecture model (95% CI 0.06 to 0.55, p = 0.01); self-efficacy scores indicated increased confidence in planning and preparing treatment.

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BRINGING THE WORLD OF SIMULATION TO ACUTE PAEDIATRICS

Wright S, Kelly K, Moller M
Royal Children’s Hospital (RCH), Brisbane, Queensland (Qld)

Over the past 5 years the RCH Physiotherapy Department has been utilising simulation as a tool to assess competency in acute paediatric physiotherapy. It became clear that SLEs (simulated learning environments) could be used in a variety of ways to meet the needs of physiotherapists across Qld, and address the current limitations to providing best practise training for students and the workforce. SLEs have been shown to provide a realistic and safe environment (Birkhoff et al 2010), that can assist communication skills (Donovan et al 2003) as well as developing of a range of clinical competencies (Bandali et al 2008). National Standards for Safety and Quality in Health in conjunction APC Standards have been established to ensure competence at a consistent national level, promoting best practice and attempting to mitigate unintended consequences associated with health care delivery.

In 2012 Children’s Health Qld, in collaboration with 3 Qld Universities, successfully gained HWA funding for a project called SLIPAH (Simulated Learning in Paediatrics for Allied Health professionals). The education of physiotherapists in the management of acute paediatrics was a vital component to this initiative. The program set out to integrate the knowledge and skills required across the education continuum, from pre-registration curricula of universities to training and evaluation of acute paediatric competencies in the workforce. Simulation scenarios have been scaffolded onto e-learning packages which specifically target necessary core experiences, with case studies embedded to provide the foundations for the scenarios.

Scenarios are rigorously developed in order to ensure that they:
• are able to be adapted in complexity to accommodate participants level of experience
• provide maximal realism and physiological responsiveness
• incorporate current evidence for best practice by engaging SMEs (subject matter experts) in the development process and ensuring peer review is undertaken
• provide optimal format for achieving learning objectives

‘Skills and Drills’ approach is taken to review clinical skills such as manual hyper-inflations, ‘Pause Discuss’ Model has a focus on clinical reasoning and ‘Immersive’ scenarios used in competency assessment. Each case has the professional standards entwined throughout, and for immersion a non-technical assessment (PINTS; Kelly et al 2011) is completed.

Ongoing evaluation of this new mode of delivering clinical training has been undertaken using the Kirkpatrick Phillips Model. Numbers of participants are collected; pre and post self efficacies completed as well as a Reactionnaire; to review scenario 1, 2 and 3. The latter has been developed specifically to assess the style of learning and adapted from a validated tool (Rae 2002). Initial analysis has shown a positive response and the next phase of evaluation (level 4) will look at educational feedback, including university faculty, clinical educators for students and senior cardiorespiratory physiotherapists.
From the start of 2014 the SLIPAH team will be providing input into all 6 Qld universities and also expanding the workforce component to 5 Qld regional centres that have capacity to treat acute infants and children. These workshops are structured to meet the needs of these departments, with particular reference to new graduate staff, those providing on-call and weekend care and community therapists dealing with CNLD. It is hoped that data will be collected to establish level 5 and 6 evidence, especially return on investment, in order to determine sustainability. The aim of this program is to empower physiotherapists so they can effectively manage acutely ill children, through a dynamic, co-ordinated and consistent approach to learning.

Acknowledgments:
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References:

INTERRATER RELIABILITY OF A PILATES MOVEMENT-BASED CLASSIFICATION SYSTEM

Yu KK1, Tulloch E2, Hendrick P3
1Registered Physiotherapist, Skyline Physiotherapy, SKP Medical Group, Hong Kong
2Professional Practice Fellow, School of Physiotherapy, University of Otago, New Zealand
3Lecturer, Division of Physiotherapy, University of Nottingham, UK

Questions: Is a Movement-Based Classification Assessment in Pilates Reliable? Can physiotherapists determine specific movement patterns for a subject? What is the interrater reliability for categorizing movement patterns into subgroups?

Design: Cross-sectional study.

Participants: Video footage of five individuals with a history of musculoskeletal injuries performing standardised Pilates movement assessment

Intervention: Video footage was uploaded to an online survey and sent via a web link to 108 trained in DMA Clinical Pilates Classification System to perform an observational assessment.

Outcome Measures: The percentage of overall agreement (\(\pi\)) and free-marginal Kappa (\(K_{\text{free}}\)) were evaluated for the interrater reliability.

Results: Interrater reliability for the detection of a directional bias was excellent (\(\pi = 0.92\), and \(K_{\text{free}} = 0.89\)); the overall interrater reliability for classifying an individual into a specific subgroup was moderate (\(\pi = 0.64\), \(K_{\text{free}} = 0.55\)). Raters who had completed levels 1 to 4 of the DMA Clinical Pilates training and who also reported using the assessment daily demonstrated excellent reliability (\(\pi = 0.89\) and \(K_{\text{free}} = 0.87\)).

Conclusion: The classification system demonstrated overall moderate to almost perfect agreement in determining the existence of a specific movement pattern and classifying individuals into a subgroup. There was an improving pattern of reliability associated with increased levels of training and experience of the raters.

Key Practice Points:
- Trained physiotherapists showed overall moderate to almost perfect agreement in the reliability of Pilates movement-based classification assessment.
- Increased levels of training and experience of trained physiotherapists improved the reliability of the classification assessment.
- Video and Internet can feasibly be used to overcome geographical limitations to improve the number of participants in reliability studies.

ORTHOPAEDIC IN-PATIENTS’ ABILITY TO REPRODUCE PARTIAL WEIGHT BEARING ORDERS: FACTORS INFLUENCING THIS AND EFFECT ON CLINICAL OUTCOMES

Yu S1, McDonald T1, Jesudason C1, Stiller K1, Sullivan T2
1Physiotherapy Department, Royal Adelaide Hospital, Adelaide
2Data Management and Analysis Centre, Discipline of Public Health, University of Adelaide, Adelaide


Design: Prospective observational study.

Participants: Fifty-one in-patients who were prescribed PWB after an orthopaedic injury/condition.

Intervention: Participants received standard medical/nursing/physiotherapy care. Physiotherapists instructed participants in PWB using the hand-under-foot, bathroom scales and/or verbal methods of instruction.

Outcome Measures: Weight bearing was measured on up to three occasions during hospitalisation using a force-sensitive insole. Factors that had the potential to influence PWB accuracy were recorded (e.g. sex, age, weight). Participants and their physiotherapist rated their perception of PWB accuracy using descriptive terms. Three-month clinical follow-up data were retrieved from medical records.

Results: The majority of participants (\(\geq 72%\)) exceeded their target load. Mean peak weight bearing ranged from 8 to 19 kg (185 to 285%) over the target load. Weight bearing significantly increased over the three measurement occasions (\(p < 0.001\)) and was significantly associated with greater body weight (\(p = 0.04\)). Participants and physiotherapists were unable to accurately gauge PWB. The incidence of clinically important complications at three-month follow-up was 9% and was not significantly associated with PWB accuracy during hospitalisation (\(p = 0.45\)).

Conclusion: Patients are unable to accurately reproduce PWB orders when trained with the hand-under-foot, bathroom scales or verbal methods of instruction. Greater body weight was associated with PWB accuracy. The impact of PWB inaccuracy on longer-term clinical outcomes is unclear.

Trial registration: ACTRN12611000797976

Key Practice Points:
- Patients are unable to accurately reproduce PWB orders.
- Apart from greater body weight, no other predictive factors were found for PWB accuracy, and patients and physiotherapists were unable to gauge PWB accuracy.
- The effect of PWB inaccuracy on longer-term clinical outcomes is uncertain.
AN INVESTIGATION OF MOBILIZATION PRACTICES IN ABDOMINAL, CARDIOTHORACIC AND GENERAL SURGICAL PATIENTS

Zafiropoulos B1, Spencer LM1, Hogan D1

1Physiotherapy Department Royal Prince Alfred Hospital Sydney

Question: Are patients following major surgery mobilized in a timely fashion, and in accordance with a mobilization clinical indicator (where patients were expected to mobilize ≥ 100 m with or without assistance by day two postoperatively)?

Design: Prospective observational pilot study.

Participants: One hundred and fifteen inpatients following major abdominal, cardiothoracic and general surgery.

Intervention: Over a one month period data regarding physiotherapy directed mobilization treatment was collected consecutively by six ward physiotherapists.

Results: Patients following major surgery generally displayed good preoperative mobility with 95% of patients able to mobilize independently with or without a gait aide. Only 48% of the total sample achieved the postoperative clinical indicator by day two with 60% of subjects achieving the clinical indicator by day three. Fifty-two per cent of patients had a reported variance preventing them from reaching the clinical indicator by day two.

Conclusion: This study demonstrated that the majority of patients did not achieve the clinical indicator by day two. This was primarily because of medical reasons including haemodynamic instability, which were listed as variances that precluded patients from reaching the clinical indicator target. These reasons were generally not related to physiotherapy intervention or process. It appeared that all patients were treated according to clinical need rather than routine protocol driven practice.

Key Practice Points:
• Physiotherapists should aim to achieve early postoperative mobilization ≥ 100 m as early as possible.
• Medical reasons may preclude the majority of patients from achieving this clinical indicator by day two.
• Physiotherapists may need to adapt mobilization protocols to suit individual patient presentations in the postoperative period.