

## The relationship between children's motor proficiency and health-related fitness

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ICC SYDNEY OCTOBER 19-21

# MOMENTUM 2017

PHYSIOTHERAPY CONFERENCE

## » CONFERENCE ABSTRACTS

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Please note that abstracts are printed as provided by the authors to the APA 2017 Conference, MOMENTUM and are correct at time of publication.

Abstracts are listed in order of sessions within the conference from Thursday 19 – Saturday 21 October, followed by abstracts for the E-Posters in Title order.

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## MOMENTUM: HOW TO BUILD IT, KEEP IT OR GET IT BACK

**McQueen M**

Plenary 1, Darling Harbour Theatre, October 19, 2017, 8:30 AM - 10:00 AM

We all love being on a roll, in sync and firing on all cylinders – that flow-state sensation where everything just seems to work. But what happens when the groove becomes a rut, inspiration evaporates or your mojo disappears? Enduring success and growth for any business today is dependent on building and maintaining unstoppable momentum.

In this fast-paced & compelling keynote presentation, audiences discover:

- The SCIENCE and ART of momentum – where it comes from and why it makes all the difference when you've got it working for you
- The 5 ENEMIES of momentum – the early warning signs that many leaders and organizations ignore till it's almost too late
- The 3 DAILY LEADERSHIP HABITS that create effortless energy in a team or business

Audience members will leave this presentation with a clear action plan for getting into a groove but more importantly staying there.

## AQUATIC EXERCISE IN CHRONIC DISEASES

**Waller B<sup>1</sup>**

<sup>1</sup>*Faculty of Sport and Health Sciences, University of Jyväskylä, Finland*

AG1, Meeting Room C3.5, October 19, 2017, 10:35 AM - 11:20 AM

Background:

The prevalence of chronic diseases, such as osteoarthritis, are increasing with the aging populations and increased sedentary lifestyles. These often result in decreased functional capacity leading to a loss of general cardiovascular fitness and muscle strength as well as quality of life and increased costs to the welfare system. Moreover, chronic disease can accelerate this process increasing the risk of co-morbidities. The aquatic environment is a facilitating one, which could be used to improve both disease related symptoms and pain as well as allow higher levels of aerobic training. However, in many cases the exercise program have focused on having an effect on the disease related symptoms e.g. pain and not on improving function or cardiovascular fitness.

Objectives:

The current trends in content of aquatic exercise interventions utilised in the current scientific literature will be explored. A discussion on which professional are responsible for specific phases of treatment will be presented with an example of osteoarthritis, a continuum management will be presented.

Key Practice Points:

- Aquatic exercise is effective at improving function at the ICF levels of body structures and function as well as activities in the management of different chronic diseases.
- Aquatic exercise interventions need to take into account the long-term health issues of decreased physical activity secondary to chronic diseases.
- While no guidelines exist for the prescription of aquatic exercise for healthy or chronic diseases, prescription should follow current guidelines for both strength and aerobic training in water.
- There is a general need for the creation of a management path that integrates both aquatic therapy and well-structured appropriately designed aquatic exercise.

## WHAT ABOUT ME? REHABILITATION FOR THE HEAVIER POPULATION

### **Spencer L**

<sup>1</sup>Physiotherapy Department RPAH, Sydney, Australia

AG1, Meeting Room C3.5, October 19, 2017, 10:35 AM - 11:20 AM

#### Background:

Rehabilitation has been shown to improve exercise capacity, quality of life and reduce hospital admissions in pulmonary and cardiac conditions. These conditions are often complicated by obesity and co morbidities. Patients with Metabolism and Obesity (M&O) conditions may not be offered the opportunity to attend rehabilitation programs and therefore miss out.

#### Objectives:

To improve access to rehabilitation for people with M&O conditions as part of a chronic disease rehabilitation redesign project in SLHD.

#### Methods:

A redesign methodology was used to identify access issues and implement changes including the commencement of a hydrotherapy program (twice weekly for twenty sessions). Participants were referred from the M&O service at RPAH.

#### Results:

Thirty-one people with M&O conditions were referred to the hydrotherapy program, [baseline: mean (SD): age 53 (13); weight 121 (30) kgs; BMI 44 (10) m/kg<sup>2</sup>; 6MWD 364 (116) m; dyspnea 2 (2)]. Nine participants (30%) completed 20 sessions showing a statistically significant change in weight of -5 kgs (-8 to -1); BMI of -2 kg/m<sup>2</sup> (-3 to -0.5) and 6MWD 45m (5 to 85). Satisfaction surveys from those participants who completed the program reported that they were: happy with the pool environment, class times and physiotherapy staff; felt more confident, could move better and were keen to continue with hydrotherapy in the community when the program was completed.

#### Key Practice Points:

- Hydrotherapy is an effective rehabilitation option for heavier people
- Participants were happy with the hydrotherapy experience
- Future research is needed to improve completion rates.

## EQUINE THORACOLUMBAR SPINE BIOMECHANICS

### **Burns G**

APG1, Meeting Room C3.4, October 19, 2017, 10:35 AM - 11:20 AM

The horse's back has been a difficult anatomical area to evaluate from a veterinary perspective. While back pain in the horse has been recognised to reduce performance, it must also be considered an issue from a welfare basis. Owners are often vigilant enough to identify tenderness in the horse's back but have little understanding of what it means.

Research into equine back pathology is progressing slowly. We have improved our diagnostic imaging techniques but our ability to interpret these results is variable. Research results may also be confounded by assuming techniques used in human back evaluations will transfer directly to the horse. A review of current research findings will be presented.

## STAYING PUT: A SYSTEMATIC REVIEW OF ACCELEROMETER USE AND PHYSICAL ACTIVITY LEVELS IN ACUTELY ILL ADULTS DURING HOSPITALISATION

Baldwin C<sup>1</sup>, **Phillips A<sup>1</sup>**, van Kessel G<sup>1</sup>, Johnston K<sup>1</sup>

<sup>1</sup>University of South Australia, Adelaide, Australia

CRP1A, Meeting Room C4.6, October 19, 2017, 10:35 AM - 11:20 AM

### Aim:

To review how objective activity monitoring has been used across studies of acutely ill inpatients. What active and sedentary behaviours have been measured; how active or sedentary are inpatients with medical or surgical admissions?

### Design:

Prospectively registered systematic review.

### Methods:

Four databases were searched. Procedures included completion of tasks in duplicate with cross-checking, and contact with corresponding authors. Risk of bias was assessed with the PEDro and Newcastle Ottawa Scales as appropriate to study design.

### Results:

42 studies were identified. Twenty-four percent of studies were of older general/mixed medical admissions; at least half of studies recruited people with a cardiorespiratory condition. Positional monitors were most commonly used. Physical activities were reported more frequently than sedentary behaviours as time spent in a particular posture, step count, number of postural transitions, and bouts. Inpatients spent 93-98.8% of their hospital stay inactive, and in most studies completed <1000 steps/day despite up to 50 postural transitions/day. Missing data was a concern from risk of bias assessment.

### Conclusion/Key Practice Points:

- This is the first review to summarise the use of wearable technology for physical activity monitoring in the acute setting; issues of missing data can be classified according to patient factors, application errors, device issues, changes in medical status, or patient flow.
- Despite heterogeneity in outcome reporting, inactivity was a common finding across groups.
- Characteristics of sedentary behaviour were less frequently described and may warrant further detailed reporting in research considering that changes in response to treatment may first be seen in sedentary patterns.

## TRACKING PHYSICAL ACTIVITY LEVELS IN CRITICALLY ILL PATIENTS DURING INTENSIVE CARE UNIT AND WARD ADMISSION

**Rollinson T<sup>1</sup>**, Said C<sup>1</sup>, Connolly B<sup>2</sup>, Berney S<sup>1</sup>

<sup>1</sup>Austin Health, Heidelberg, Australia, <sup>2</sup>Guy's & St Thomas' NHS Foundation Trust, London, United Kingdom

CRP1A, Meeting Room C4.6, October 19, 2017, 10:35 AM - 11:20 AM

### Aim:

To quantify physical activity levels of critically ill patients who commenced physical rehabilitation in the intensive care unit and continued receiving rehabilitation on the ward. We hypothesised that ward-based patients would demonstrate higher activity levels than patients in intensive care.

### Design:

Single-centre, prospective observational study.

### Method:

Critically ill patients, ≥18 years of age who received more than 48 hours of mechanical ventilation and meeting local criteria for commencing physical rehabilitation in the intensive care unit were eligible for inclusion. Patients wore SenseWear Armbands (BodyMedia Inc, USA), 0800-1900, from time of commencing physical rehabilitation until hospital discharge or Day 14 of ward stay (whichever occurred first). The primary

outcome was time (minutes) spent performing physical activity of greater than 1.5 metabolic equivalent tasks (METs), using 1 MET as a reference to indicate baseline metabolic activity.

#### Results:

Sixty patients were enrolled from 2014 to 2016. Patients spent a median [IQR] of 9 [7-16] days in intensive care prior to enrolment with an intensive care (5 [3-11] days) and ward (12 [6-30] days) length of stay. In intensive care, patients spent 6 [0-21] minutes/day doing physical activity and 29 [9-73] minutes on the ward. Physical activity was significantly higher on the ward.

#### Conclusion / Key Practice Points

- Physical activity of patients recovering from a critical illness is low.
- Further data analysis will explore subgroups of patients in whom activity levels may differ.
- Physical activity levels were low in intensive care with an increase evident following transfer to the ward.

#### IN SURVIVORS OF A CRITICAL ILLNESS, THE SIX-MINUTE WALK DISTANCE PROVIDES INFORMATION ON WARD LENGTH OF STAY AND DISCHARGE DESTINATION

**Mackney J<sup>1,2</sup>**, Jenkins S<sup>1,3,4</sup>, Havill K<sup>5</sup>, Harrold M<sup>1</sup>, Jacques A<sup>1</sup>, Hill K<sup>1,3</sup>

<sup>1</sup>Curtin University, Perth, Australia, <sup>2</sup>The University of Newcastle, Callaghan, Australia, <sup>3</sup>Institute for Respiratory Health, Perth, Australia, <sup>4</sup>Sir Charles Gairdner Hospital, Perth, Australia, <sup>5</sup>John Hunter Hospital, Newcastle, Australia

CRP1A, Meeting Room C4.6, October 19, 2017, 10:35 AM - 11:20 AM

#### Aim:

In survivors of critical illness, to determine if six-minute walk distance (6MWD), measured within one week of discharge to the ward from an intensive care unit (ICU), provided information regarding ward length of stay (LOS) and discharge destination.

#### Design:

A prospective observational study.

#### Methods:

Forty-nine survivors of critical illness were recruited during their ICU admission. Data pertaining to the ICU admission were extracted from medical notes. Within one week of discharge to the ward, a six-minute walk test was completed. The ICU and ward LOS, and discharge destination were recorded.

Results: median [range] age was 56 [27-71] years, duration of mechanical ventilation 8.5 [2.5-36.7] days, ward LOS 11 [5-79] days and 6MWD 210 [0-472] m. A 6MWD <100 m increased the odds of being discharged to a facility (OR: 10.64, 95% CI: 2.40 to 47.62,  $p = 0.002$ ). Ward LOS increased significantly for participants with a 6MWD of <100 m ( $p = 0.006$ ). Receiver operating characteristic curve analysis determined a cutoff point of 14 days for ward LOS for 6MWD < or  $\geq 100$  m (area under the curve = 0.837;  $p < 0.001$ ).

#### Conclusions/Key Practice Points:

- When compared to those who achieved a 6MWD  $\geq 100$  m, survivors of critical illness with a 6MWD <100 m were more likely to stay on the ward for  $\geq 14$  days and be discharged to a facility other than home.
- This information may be used to guide recovery expectations.

## PHYSIOLOGICAL RESPONSES TO ACUTE HYPOBARIC HYPOXIA IN HEALTHY INDIVIDUALS

**Morris N<sup>1</sup>**

<sup>1</sup>Griffith Univeristy and The Prince Charles Hospital, Southport, Australia

CRP1B, Meeting Room C4.7, October 19, 2017, 10:35 AM - 11:20 AM

### Aim:

This presentation will contrast the physiological response to high altitude exposure in healthy individuals with those of cardiopulmonary disease and the effect of age using data from a study of 28 individuals that summited Mt Kilimanjaro in Tanzania in 2016.

### Rationale/Methods/Results:

Individuals exposed to high altitude are faced with a severe hypoxia resulting in a hyperventilatory response that aims to protect arterial oxygen content. This hyperventilatory response is a hallmark of diseases such as pulmonary hypertension and chronic heart failure. Along with physiotherapist Helen Seale Prof Morris was part of research team from Mayo that studied this group of healthy individuals, whose ages ranged from 22-68 years, at three different altitudes during the ascent. With progressive altitude exposure individuals became more hypoxic and developed signs and symptoms of cardiopulmonary disease, particularly during exercise.

### Conclusions:

Surprisingly, despite the physiological changes in respiratory function that occur with age, older individuals tolerated high altitude induced hypoxemia extremely well secondary to an improved hypoxic ventilatory drive. Whilst this drive may be effective in managing the acute response to hypoxia, the long-term effects may have significant physiological implications.

## PHYSIOLOGICAL RESPONSES TO ACUTE HYPERBARIC HYPOXIA IN THE INTENSIVE CARE UNIT

**Ntoumenopoulos G<sup>1</sup>**

<sup>1</sup>University of Technology Sydney, Sydney, Australia

CRP1B, Meeting Room C4.7, October 19, 2017, 10:35 AM - 11:20 AM

### Aim:

This presentation will describe the physiological response to acute respiratory distress syndrome, a non-cardiogenic pulmonary oedema, with bilateral chest wall infiltrates, poor lung compliance and severe hypoxaemia non-responsive to oxygen therapy.

### Rationale/Results:

This syndrome presents many challenges for physiotherapy assessment and management. Standard medical management includes tailoring mechanical ventilation to reduce the risks of further lung injury by using low tidal volumes and optimal positive end expiratory pressure. Also by targeting lower levels of arterial oxygen saturation 88-92% and accepting hypercarbia will further minimise lung injurious ventilation strategies. Neuromuscular blocking agents, prone positioning and lung recruitment strategies may also be used to further optimise oxygenation and ventilation. The more severe hypoxaemic cases may also require extracorporeal membrane oxygen support. This acute patient group poses many significant challenges to physiotherapy, where identification of patient problems and intervention may not commence often until the acute condition has resolved.

### Conclusion/Key Practice Points:

- The presentation will explore the evidence pertaining to the physiotherapy interventions during the acute hypoxemic phase that will describe the physiological changes that may occur, the implications and any interventions that may assist to optimise ventilation.
- With a better understanding of the physiological responses to acute hyperbaric hypoxia and the evidence for interventions designed to maintain ventilation, physiotherapists will be better equipped to manage these challenging patients in any setting.

## PHYSIOLOGICAL RESPONSES TO CHRONIC HYPOXEMIA SECONDARY TO LUNG DISEASE

**Alison J<sup>1</sup>**

<sup>1</sup>*The University of Sydney, Sydney, Australia*

CRP1B, Meeting Room C4.7, October 19, 2017, 10:35 AM - 11:20 AM

### Aim:

This presentation will examine the physiological responses to exercise in individuals with chronic hypoxemia secondary to lung disease.

### Rationale/Results:

People with chronic lung diseases often experience hypoxaemia that is typically exacerbated during exercise. With a marked reduction in exercise capacity and decreased levels of physical activity, exercise-based rehabilitation is seen as essential in the long-term management in this chronically hypoxemic group. Prof Alison has extensive clinical and research experience examining both the acute and chronic physiological responses to exercise in individuals with chronic lung disease.

### Conclusion/Key Practice Points:

In this presentation, Professor Alison will discuss the effects of hypoxaemia on exercise capacity in people with chronic lung disease and report on the effects of oxygen supplementation during an acute bout of exercise and during an exercise training program in people with chronic obstructive pulmonary disease.

## PHYSIOLOGICAL RESPONSES TO CHRONIC HYPOXEMIA IN THE TRANSPLANT PATIENT: RESPONSES TO THERAPY

**Walsh J<sup>1</sup>**

<sup>1</sup>*The Prince Charles Hospital, Brisbane, Australia*

CRP1B, Meeting Room C4.7, October 19, 2017, 10:35 AM - 11:20 AM

### Aim:

In this presentation, Dr Walsh will discuss the implications of severe hypoxia and exercise-induced desaturation while assessing a candidate's functional status and prescribing exercise rehabilitation in the work up phase pre-transplantation.

### Rationale and Results:

Exercise rehabilitation is essential for people being considered for lung transplantation with a candidate's poor functional status an absolute contraindication. Hypoxia and exercise-induced desaturation, along with breathlessness, are common physiological consequences of severe lung disease. Following lung transplantation, recipient's respiratory function recovers relatively rapidly in relation to measures of exercise capacity with peripheral muscle strength strongly associated to post-transplant exercise capacity. With extensive experience in pre and post lung-transplant patient assessment and management, Dr Walsh has tracked changes in functional capacity in these severely hypoxemic patients for several years post-transplant. Results of his extensive database on these patients that provides insight into factors which may predict physical activity will be presented.

### Conclusion/Key Practice Points:

Dr Walsh will discuss the implications of reperfusion injury and reoxygenation on lung transplant recipients recovery in functional capacity. Importantly, factors which impact on peripheral muscle function should be managed carefully as these often relate to long-term patient outcomes.

## DESIGNING FEEDBACK FOR LEARNING: MOVING FORWARD FROM A PRACTICE OF TELLING

**Molloy E<sup>1</sup>**

<sup>1</sup>*University of Melbourne, Melbourne, Australia*

EDU1, Meeting Room C4.11, October 19, 2017, 10:35 AM - 11:20 AM

Feedback is a challenging but very important business. Despite evidence that it is important for learning, feedback is still reported as one of the most challenging aspects of the learner's experience. Learners report that they want more feedback, and that they want it in a form they can pick up and use. Educators find it difficult to give honest yet sensitive feedback, and often they approach written and verbal feedback with anxiety for fear of upsetting learners.

This session argues for an alternative way of looking at feedback practices in the classroom and work-based setting. We will explore recent frameworks proposed by Boud and Molloy (2013) called Feedback Mark 1 and Mark 2. Here, feedback is re-conceptualised as an activity driven by learners, rather than an act of 'telling' imposed on learners.

This approach challenges traditional 'learning as apprenticeship' cultures where feedback rituals resemble experts telling learners what is going right and what is going wrong. Another emerging trend in feedback research is the role of technology in enabling new opportunities for feedback exchanges.

Digital multimedia recordings (such as audio and video-based feedback), intelligent tutors, text annotations, google glass and student response systems represent some of the approaches being trialled. In general, these approaches are reported to generate positive student outcomes, however some of the challenges for educators and learners will be highlighted.

Regardless of whether the feedback is human or technology-mediated, thoughtful design of the process is key. Embedded in the design is i) orientation to purpose (where both learners and educators have a shared understanding of the purpose of feedback), and ii) nested, incremental tasks where learners can see the effect of engaging with feedback.

## EXTENDING THE BENEFITS OF PHYSIOTHERAPY IN COMMUNITY SETTINGS - A PARKINSON FOCUS

**Latham N<sup>1</sup>**

<sup>1</sup>*Harvard University, Boston, United States*

GPA1, Meeting Room C3.6, October 19, 2017, 10:35 AM - 11:20 AM

Numerous randomized controlled trials (RCTs) now support the benefits of exercise and physical therapy (PT) to improve function and health in many patient groups, including older people post hip fracture and persons with chronic conditions such as Parkinson's disease (PD). However, many exercise and rehabilitation programs have been delivered at a frequency, intensity and duration that cannot be replicated in most health systems.

This talk will discuss RCTs that have explored the use of different technologies and approaches to extend the benefits of rehabilitation from traditional in-person PT to longer term community based programs. First, an RCT of a DVD-based home exercise program for people after usual hip fracture rehabilitation ended (n=232) found significant functional benefits after 6 and 9 months of follow up in the exercise group compared to control despite minimal in-person PT contact.

Next, an RCT (n=50) in persons with PD of an exercise program supported by a mobile health exercise app versus the exercise program alone found significant benefits in mobility outcomes over 1 year.

Finally, new technologies approaches that have recently been developed by our team such as a Virtual Coach to promote skin care in persons with SCI (RCT n=40) will be discussed.

Technology holds promise as a way to extend rehabilitation's benefits, but clinician and patient input is essential for future success and rigorous pragmatic RCTs are needed to ensure the effectiveness and safety of these interventions.

#### Key Practice Points:

- The session will help participants to understand the current evidence that supports different approaches to extend rehabilitation and continue long-term home-based exercise programs for older people, in particular people post-hip fracture and with Parkinson's Disease.
- This session will also help participants to understand how their practice might change in the future as developments in technology might support the delivery of PT and rehabilitation care in new ways.

#### HOW TO ASSESS FOR PAIN SENSITISATION IN THE CLINIC: NEW EVIDENCE FOR NECK AND ARM PAIN

**Rebbeck T<sup>1</sup>**, Beales D<sup>2</sup>

<sup>1</sup>University of Sydney, Lidcombe, Australia, <sup>2</sup>Curtin University, Bentley, Australia

MPA1A, Meeting Room C4.9, October 19, 2017, 10:35 AM - 11:20 AM

#### Background:

Increased pain sensitisation assessed by quantitative sensory testing (QST), such as cold hyperalgesia, is associated with poor outcomes in cervical pain states. More detailed pain assessments of pain are warranted in clinical practice. Our work has demonstrated a relationship between clinical tests of pain sensitivity (ice pain, pressure pain) and QST, and has investigated the association of these tests with long term outcome in cervical spine states. We have investigated cut-off points for patient administered questionnaires to determine central sensitization. Other clinical tests used to assess for pain sensitisation include nerve trunk palpation and 2-point discrimination. This new evidence enables clinicians to assess for pain sensitivity.

#### Aims / objectives:

To improve participants' knowledge, skills and clinical reasoning in the clinical assessment of pain sensitisation. Participants will be competent in clinical application of the ice-pain test, pressure pain thresholds, 2-point discrimination, upper limb nerve trunk palpation and understand how to interpret pain sensitivity questionnaires. Participants will understand how to use results to sub-classify pain and direct treatment.

#### Approach:

The presenters will provide a lecture style background introduction (10 mins) followed by a practical demonstration of the tests (10 mins). Participants will then have the opportunity to practise 1-2 of these tests (10 minutes). Learning materials provided include a participant manual.

#### Conclusion / Key Practice Points:

Participants will be able to:

- Accurately assess for pain sensitisation in their clinic.
- Understand how to interpret pain sensitivity questionnaires
- Use this information to inform treatment.

#### A CLINICAL FRAMEWORK FOR IDENTIFYING MODIFIABLE AND NON-MODIFIABLE CONTRIBUTORS TO DISABLING LOW BACK PAIN

**Mitchell T<sup>1</sup>**

<sup>1</sup>Curtin University, School of Physiotherapy and Exercise Science, Perth, Australia

MPA1B, Meeting Room C4.5, October 19, 2017, 10:35 AM - 11:20 AM

Research overwhelmingly supports that musculoskeletal pain disorders are mediated and moderated by a range of physical, cognitive, emotional, social and lifestyle factors. This argues for an approach that considers the Bio as well as the psychosocial aspects of pain. The Curtin University musculoskeletal teaching team has developed a Clinical Translation Framework that assists clinicians in identifying modifiable and non-modifiable contributors to an individual's presentation. Application of this framework in real-world clinical scenarios for disabling low back pain will be discussed.

## COGNITIVE FUNCTIONAL THERAPY FOR DISABLING LOW BACK PAIN

**O'Sullivan P<sup>1</sup>**

<sup>1</sup>*Curtin University, School of Physiotherapy and Exercise Science, Perth, Australia*

MPA1B, Meeting Room C4.5, October 19, 2017, 10:35 AM - 11:20 AM

Contemporary evidence regarding disabling LBP highlight the multi-dimensional complexity of the disorder and challenges current practice to reframe our understanding and management of back pain disorders. Cognitive functional therapy provides a personalized multi-dimensional understanding of LBP, pain control strategies to enable people to build confidence to return to feared and avoided valued activities and addresses unhelpful lifestyle behaviors. There is growing evidence that this approach results in long-term benefits to people with LBP.

## PHYSICAL AND PSYCHOSOCIAL CHARACTERISTICS OF CURRENT CHILD DANCERS AND NON-DANCERS WITH SYMPTOMATIC JOINT HYPERMOBILITY: A DESCRIPTIVE ANALYSIS

**Nicholson L<sup>1</sup>**

<sup>1</sup>*The University of Sydney, Lidcombe, Australia*

MPA1C, Meeting Room C4.10, October 19, 2017, 10:35 AM - 11:20 AM

**Aim:**

To determine the effect of dance training on pain, joint instability and quality of life of children with symptomatic hypermobility

**Design:**

A cross-sectional observational study

**Method:**

Children and a parent completed reports providing data on demographic variables, symptoms, organised activity participation, health-related quality of life, and fatigue. Physical and functional measures included extent of hypermobility, aerobic fitness, balance, and muscle endurance.

**Results:**

102 children with symptomatic hypermobility were recruited from The Children's Hospital at Westmead. Of these 22 were undertaking dance classes averaging 3.3 hours/week (range 1-11 hours). While the dancers reported a similar number of painful joints as non-dancers ( $p = 0.36$ ), they reported significantly lower pain levels ( $p = 0.04$ ), and found pain less problematic ( $p = 0.04$ ), affecting less of their body ( $p = 0.03$ ). They reported fewer unstable joints ( $p = 0.001$ ) despite being more hypermobile (Beighton score,  $p = 0.047$ ; Lower Limb Assessment Score,  $p = 0.02$ ). The child dancers reported significantly better health-related quality of life particularly in the subdomain of school functioning ( $p = 0.004$ ) and reported less fatigue ( $p = 0.024$ ).

**Conclusion/Key Practice Points:**

- Children with symptomatic hypermobility who are currently undertaking formal dance training have less joint pain and instability symptoms, less fatigue, and better health-related quality of life.
- The cross-sectional nature of the study means that causation cannot be determined.

## BEIGHTON SCORES AND CUT-OFFS ACROSS THE LIFESPAN: CROSS-SECTIONAL STUDY OF AN AUSTRALIAN POPULATION

**Singh H<sup>1</sup>**, Nicholson L<sup>1</sup>, Chan C<sup>1</sup>, McKay M<sup>1</sup>, Baldwin J<sup>1</sup>, Burns J<sup>1</sup>, Hiller C<sup>1</sup>

<sup>1</sup>*The University of Sydney, Camperdown, Australia*

MPA1C, Meeting Room C4.10, October 19, 2017, 10:35 AM - 11:20 AM

**Aim:**

To determine the normal extent of hypermobility across the lifespan given that the Beighton score for Generalised Joint Hypermobility (GJH) varies with gender, age and ethnicity.

**Design:**

A cross-sectional study of male and female Australians of all ages identifying the Beighton cut-off that identified the uppermost 5% of the population.

**Method:**

1000 healthy individuals aged 3-101 years were recruited through print, radio and social media. All underwent testing for GJH using the Beighton Scoring system. Participants were grouped by decade and binary logistic regression was conducted to determine whether the traditional cut-off of  $\geq 4/9$  identified only the uppermost 5% as hypermobile.

**Results:**

Females and non-Caucasians had higher Beighton scores across the lifespan ( $p < 0.001$ ). Cut-off scores for females are suggested to be  $\geq 6$  aged 3-7 years,  $\geq 5$  aged 8-39 years,  $\geq 4$  aged 40-59 years,  $\geq 3$  aged 60-69 years and  $\geq 2$  aged 70+ years. For males, the suggested cut-offs are  $\geq 5$  aged 3-7 years,  $\geq 4$  aged 8-39 years,  $\geq 2$  aged 40-59 years and  $\geq 1$  aged 60+ years. Low sensitivity, high specificity and a 60% false positive rate was found if a cut-off of  $\geq 4/9$  is used for both sexes across the lifespan.

**Conclusion/Key Practice Points:**

- A cut-off of  $\geq 4$  is only appropriate for females aged 40-59 years and males aged 8-39 years.
- In clinical practice, to lower the risk of a false positive diagnosis of GJH further tests of hypermobility need to be utilised.

**VALIDATION OF AN UPPER AND A LOWER LIMB TOOL TO QUANTIFY JOINT HYPERMOBILITY**

**Chan C<sup>1</sup>**, Hopper L<sup>2</sup>, Pacey V<sup>3</sup>, Meyer K<sup>1</sup>, Zhang F<sup>1</sup>, Nicholson L<sup>1</sup>

<sup>1</sup>The University Of Sydney, Camperdown, Australia, <sup>2</sup>Edith Cowan University, Mt Lawley, Australia,

<sup>3</sup>Macquarie University, North Ryde, Australia

MPA1C, Meeting Room C4.10, October 19, 2017, 10:35 AM - 11:20 AM

**Aim:**

To validate the use of the Upper Limb and Lower Limb Hypermobility Assessment Tools, in an adult population.

**Design:**

Cross-sectional study of Australians aged 18-40 years, across three groups representing varying levels of hypermobility: i) control, ii) likely hypermobile cohort (i.e. elite dancers), and iii) known hypermobile cohort (i.e. participants with Ehlers-Danlos Syndrome–Hypermobility Type).

**Method:**

112 participants were recruited and assessed using the Upper Limb Hypermobility Assessment Tool and Lower Limb Assessment Scale. Pearson's correlation coefficients and multivariate analysis of variance assessed between-group differences. A cut-off scores were determined using median and inter-quartile ranges, and the Receiver Operator Characteristic Curve. The diagnostic accuracy of the two hypermobility tools for Generalised Joint Hypermobility was assessed through percent agreement with clinical opinion (i.e. comprehensive history, five-part historical hypermobility questionnaire, Beighton Score, and peripheral joint assessment).

**Results:**

Both tools distinguished the control cohort from the other two cohorts (all  $p < .01$ ). The optimal cut-off score for diagnosing upper limb hypermobility was 7/12 with a specificity of 84% and sensitivity of 77%. The optimal cut-off score for diagnosing lower limb hypermobility was 7/12 with a specificity of 86% and sensitivity of 68%. Both tools had moderate to excellent agreement with clinical opinion across all three cohorts (69-98%).

**Conclusion/Key Practice Points:**

- The Upper Limb Hypermobility Assessment Tool and Lower Limb Assessment Scale are valid tools for diagnosing limb-specific hypermobility and Generalised Joint Hypermobility in adults.
- A cut-off score of  $\geq 7/12$  for both tools should be used in adults.

## THE NATURAL HISTORY OF CHILDREN WITH JOINT HYPERMOBILITY SYNDROME AND EHLERS-DANLOS HYPERMOBILITY TYPE: A LONGITUDINAL COHORT STUDY

**Pacey V<sup>1</sup>**, Scheper M<sup>3</sup>, Tofts L<sup>4</sup>, Adams R<sup>2</sup>, Nicholson L<sup>2</sup>

<sup>1</sup>Macquarie University, North Ryde, Australia, <sup>2</sup>The University of Sydney, Camperdown, Australia, <sup>3</sup>University of Applied Sciences, Amsterdam, Netherlands, <sup>4</sup>Kids Rehab, The Children's Hospital at Westmead, Westmead, Australia

MPA1C, Meeting Room C4.10, October 19, 2017, 10:35 AM - 11:20 AM

### Aim:

To describe the factors contributing to functional decline over a 3 year period in children with symptomatic hypermobility.

### Design:

Prospective longitudinal observational cohort

### Method:

101 children with symptomatic hypermobility aged 6 – 16 years were observed every 18 months over a three year period. Child-reported quality of life, self-reported physical activity and walking ability assessed functional ability. Multisystemic complaints, postural control, muscle endurance, fatigue, pain and joint hypermobility were also assessed. Cluster-analysis performed at baseline identified severity subgroups. Mixed linear regression models determined subsequent trajectories. Exploratory factor analysis then investigated the underlying constructs contributing to function three years later.

### Results:

Cluster analysis identified children as mildly (n = 40), moderately (n = 31) or severely affected (n = 30) at baseline. Reduced functional ability at baseline was predictive of worsening trajectories of reduced walking ability (B = -0.40 (95% CI -0.73 to -0.08) p = 0.02) and decreased quality of life (B = -1.19 (95% CI -1.41 to -0.96) p < 0.001) over the next three years. Factor analysis identified four underlying constructs that explained 83.5% of variance in functional ability at three years: multi-systemic effects, pain, fatigue and loss of postural control (p = 0.046).

### Conclusion/Key Practice Points:

- Children with symptomatic hypermobility who have a high number of multi-systemic complaints, high pain intensity, worse fatigue and poor postural control are most likely to deteriorate over the next three years.
- Identification of those children most at risk of functional decline suggests prioritisation of treatment is warranted.

## WHICH INSTRUMENT BEST MEASURES PATIENT ATTITUDES AND CAPABILITIES REGARDING OSTEOARTHRITIS SELF-MANAGEMENT? A SYSTEMATIC REVIEW

**Eyles J<sup>1,2,3</sup>**, Hunter D<sup>1,2</sup>, Meneses S<sup>1,2</sup>, Collins N<sup>4</sup>, Dobson F<sup>5</sup>, Lucas B<sup>3</sup>, Mills K<sup>6</sup>

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MPA1D, Meeting Room C4.3, October 19, 2017, 10:35 AM - 11:20 AM

### Purpose:

To make a recommendation on the “best” instrument to assess attitudes toward and/or capabilities regarding self-management of osteoarthritis (OA) based on available measurement property evidence.

#### Methods:

Electronic searches identified studies testing measurement properties of instruments assessing self-reported attitudes and/or capabilities regarding self-management of OA (MEDLINE [PubMed], EMBASE and PsychINFO [OvidSP], CINAHL [Ebsco]; from inception to 27 December 2016). Two reviewers independently screened abstracts, reviewed full texts and extracted data. For included studies; two reviewers independently rated the measurement properties using the Consensus-based Standards for the selection of Health Measurement Instruments (COSMIN) 4-point scale and quality criteria for rating results of measurement properties. Best evidence synthesis considered COSMIN ratings, quality criteria and the level of evidence available for each measurement property of each instrument.

#### Results:

From 5653 publications retrieved from the search strategy, eight unique measurement tools were identified for evaluation: Multidimensional Health Locus of Control, Perceived Behavioural Control, Patient Activation Measure, Educational Needs Assessment, Perceived Efficacy in Patient–Physician Interactions -5 (PEPPI-5) and -10-point versions, Stages of Change Questionnaire in Osteoarthritis and Effective Consumer Scale. Measurement properties assessed included; internal consistency, test-retest reliability, structural, construct and cross-cultural validity. The Dutch PEPPI-5 demonstrated the best measurement property evidence: strong evidence for internal consistency and structural validity but limited evidence for reliability and construct validity.

#### Conclusion/Key Practice Points:

- There is a poor level of evidence available concerning measurement properties of instruments assessing attitudes toward and/or capabilities regarding OA self-management.
- Further well-designed studies investigating measurement properties of existing instruments are required.

#### AGE-RELATED CHANGES IN STABILISATION AT THE GLENOHUMERAL JOINT

**Rathi S<sup>1,2</sup>**, Taylor N<sup>3</sup>, Green R<sup>3</sup>

<sup>1</sup>PhD Candidate, La Trobe University, Australia, <sup>2</sup>M.Physio, St John of God Hospital, Australia, <sup>3</sup>PhD, La Trobe University, Australia

MPA1D, Meeting Room C4.3, October 19, 2017, 10:35 AM - 11:20 AM

#### Aim:

To compare glenohumeral joint translation in asymptomatic young and older people with and without rotator cuff contraction.

#### Design:

Two group comparison study

#### Method:

Twenty young ( $23.6 \pm 5.3$  years) and 20 older ( $66.5 \pm 7.8$  years) participants, with no history of shoulder pathology were recruited. Anterior and posterior glenohumeral joint translations were measured using real time ultrasound in testing conditions (with and without translation force, with and without isometric internal rotation and external rotation contraction), in two positions (shoulder neutral, shoulder 90 degrees abduction) and two ultrasonographic views (anterior, posterior).

#### Results:

Younger participants demonstrated increased passive glenohumeral joint laxity compared to the older group in three out of four testing positions ( $p < 0.05$ ). In younger participants, rotator cuff muscle contraction led to greater reductions in glenohumeral joint translation in neutral anterior, neutral posterior and abducted posterior positions ( $p < 0.03$ ) compared with older participants. In both groups there were significant differences between the amount of translation limited by anterior and posterior rotator cuff muscles in response to anterior and posterior translation force ( $p < 0.03$ ), indicating their activity to be direction-specific through a tethering mechanism.

#### Conclusion/Key Practice Points:

- Rotator cuff limits glenohumeral joint translation in a direction-specific manner in both young and old participants
- Although there was increased passive translation in the younger participants, they had greater ability to stabilise the glenohumeral joint with contraction of the rotator cuff muscles than the older participants
- Age-related changes may need to be taken into account when assessing and treating glenohumeral joint stability.

#### INTEGRATING CULTURALLY INFORMED APPROACHES INTO THE PHYSIOTHERAPY ASSESSMENT AND TREATMENT OF CHRONIC PAIN: A PILOT RANDOMISED CONTROLLED TRIAL.

**Brady B**<sup>1,2</sup>, Veljanova I<sup>1</sup>, Schabrun S<sup>1</sup>, Chipchase L<sup>1</sup>

<sup>1</sup>Western Sydney University, Lidcombe, Australia, <sup>2</sup>Liverpool Hospital, Liverpool, Australia

MPA1D, Meeting Room C4.3, October 19, 2017, 10:35 AM - 11:20 AM

#### Aim:

To determine the feasibility of implementing, and the patient engagement with, a 'culturally adapted physiotherapy' assessment and treatment approach for chronic pain compared to 'usual physiotherapy' care.

#### Design:

A participant- and assessor-blinded pilot randomised controlled trial.

#### Method:

Forty-eight participants with chronic non-specific pain, identifying as Assyrian, Mandaean or Vietnamese, were randomised to 'culturally adapted physiotherapy' or 'usual physiotherapy'. All participants attended a maximum of 10 sessions over a three-month period. Primary outcomes (attendance, adherence and satisfaction) were collected at three months. Secondary outcomes (pain, physical function and psychosocial function) were collected at baseline and three months to inform feasibility. Independent samples t-tests and two-way mixed analysis of variance were calculated and intention-to-treat analyses used.

#### Results:

96% of participants undergoing 'culturally adapted physiotherapy' completed treatment, compared with 42% of the 'usual physiotherapy' group. Attendance and adherence were significantly higher in the 'culturally adapted physiotherapy' group ( $p = 0.003$  and  $p = 0.002$  respectively). No significant between group effect was found for any secondary outcome measure. Both groups improved in their six-minute walk distance (mean 36.57m, 95% CI 18.65 to 54.49,  $p < 0.001$ ), sit-to-stand performance (mean 1.8 reps, 95% CI 0.05 to 3.613,  $p = 0.04$ ) and pain (mean 0.6, 95% CI 0.04 to 1.16) over time.

#### Conclusion:

Physiotherapy approaches for chronic pain can be culturally adapted to improve the attendance and adherence of culturally diverse chronic pain sufferers to physiotherapy treatment. A fully powered trial is required to determine if improved attendance and adherence translates to improved clinical outcomes.

#### EXPLORING SOCIOCULTURAL DIMENSIONS OF CHRONIC PAIN: THE CLINICAL UTILITY OF THE PICTORIAL REPRESENTATION OF ILLNESS AND SELF MEASURE (PRISM).

**Brady B**<sup>1,2</sup>, Veljanova I<sup>1</sup>, Southwell T<sup>1</sup>, Chipchase L<sup>1</sup>

<sup>1</sup>Western Sydney University, Campbelltown, Australia, <sup>2</sup>Liverpool Hospital, Liverpool, Australia

MPA1D, Meeting Room C4.3, October 19, 2017, 10:35 AM - 11:20 AM

#### Aim:

To validate the burden of suffering measured with PRISM in culturally diverse patients with chronic pain.

#### Design:

A perspective observational reliability and validity study

#### Method:

Two hundred and fifty patients with chronic pain, identifying as Assyrian, Arabic or Vietnamese were recruited from four hospitals in Sydney where they were attending physiotherapy treatment. All participants completed a demographic interview, the PRISM assessment and translated Brief Pain Inventory, Depression Anxiety and Stress Scale and Short-Form 36 Health Survey. The PRISM was repeated 24-48 hours later. Reliability was assessed using intra-class correlation coefficients (ICC) and criterion validity using Spearman's correlation coefficient. Content validity was assessed qualitatively.

#### Results:

Intra-class correlation coefficients demonstrated excellent reliability for PRISM disks evaluating 'pain' (ICC 0.78), 'spouse/partner' (ICC 0.99), 'family' (ICC 0.80), 'spirituality' (ICC 0.99), and 'work' (ICC 0.99). The reliability of 'recreation' was fair-good (ICC 0.61). Suffering quantified by PRISM correlated significantly with clinical measures of Brief Pain Inventory severity ( $r = -0.328$ ,  $p < 0.001$ ), interference ( $r = -0.337$ ,  $p < 0.001$ ) and Short-Form 36 physical component ( $r = 0.337$ ,  $p < 0.001$ ) and mental component sub-scores ( $r = 0.345$ ,  $p < 0.001$ ). Qualitative data revealed that the PRISM was well understood and consistency interpreted by participants.

#### Conclusion:

The PRISM is a reliable and valid tool for measuring pain related suffering in culturally diverse communities. It is quick, easy to understand and not dependent on written literacy. When used in physiotherapy, the PRISM provides an exploration of the sociocultural elements of pain yielding valuable qualitative information.

### MOVING MORE AND SITTING LESS – A NEW PHYSICAL ACTIVITY PARADIGM FOR CHRONIC DISEASE PREVENTION

#### **Dunstan D<sup>1,2</sup>**

<sup>1</sup>Baker Heart and Diabetes Institute, Melbourne, Australia, <sup>2</sup>Mary MacKillop Institute for Health Research, Australian Catholic University, Melbourne, Australia

NNG1, Meeting Room C4.8, October 19, 2017, 10:35 AM - 11:20 AM

Physical inactivity is responsible for 6–10% of annual global mortality – five million of the 57 million deaths are from non-communicable diseases such as diabetes and coronary disease. The detrimental impacts of "lifestyle" factors, including physical inactivity, may soon arrest the positive historical life-expectancy trend, with people experiencing more years of living with chronic diseases, frailty and compromised quality of life. Recent evidence from our group and others underscores the importance of focusing not only on increasing physical activity, but also on reducing sedentary behaviours: the high volumes (7-10 hours) of time that adults spend sitting in their "non-exercise" waking hours.

Human experimental studies have begun to address the impact of prolonged sitting time on cardio-metabolic and mental health parameters. Specifically, attention has been directed at the establishment of experimental models that are solutions-focused, that is, understanding the impact of various counter-measures to prolonged sitting to offset the deleterious health impacts. Recent studies have consistently showed clinically meaningful acute improvements in postprandial glucose metabolism following the initiation of frequent (every 20–30 min) short (2–3 min) interruptions during prolonged sitting involving either light-intensity or moderate-intensity ambulation, standing, or simple resistance activities. Some have also demonstrated improved responses in blood pressure, lipids, haemostatic markers and cognitive function. Already, some leading health agencies have taken a proactive stance on this issue through the release of new recommendations/advice within physical activity recommendations on the likely importance of reducing sedentary behaviour, in addition to the promotion of more bodily movement across the day.

#### Key Practice Points:

- Excessive sitting is highly prevalent across society and is the most predominant behavior undertaken during waking hours
- Prolonged sitting induces numerous detrimental physiological responses
- Acute studies demonstrate that regular active breaks during prolonged sitting can improve glucose metabolism, blood pressure, cognitive function and mood
- Physical activity promotional messages should be directed at encouraging Australians to Move More and Sit Less everyday.

## BUILDING MOMENTUM: CHANGING PARADIGMS IN PAEDIATRIC PHYSICAL ACTIVITY RESEARCH

**de Groot J<sup>1,2</sup>**

<sup>1</sup>HU University of Applied Sciences, Utrecht, Netherlands, <sup>2</sup>Netherlands Institute for Health Services Research (NIVEL), Netherlands

NPG1, Meeting Room C4.1, October 19, 2017, 10:35 AM - 11:20 AM

This presentation will focus on the research perspective how health and social care worlds meet in our changing society. For a long time, research in physical therapy has used models such as the ICF or Bouchard for describing relations between respectively fitness, function and participation in physical activity (PA) or between PA and health -related fitness. In the Netherlands, as part of the EU, a shift is happening to patient/person-centred care, very much in line with the definition of positive health, with emphasis on self-management, prevention and promotion of healthy behaviors for people with multiple and complex long-term conditions. This means a change for healthcare providers and researchers. We know that not only personal, but many societal factors are associated with behaviors. So while patient-centered care includes an individual approach to assess personal factors, it should also include addressing those societal factors. This means a change for healthcare providers and researchers. This means seeking ways to include contextual factors into practice. This means seeking ways to include contextual factors into practice. This means an interdisciplinary approach and collaboration with professionals from the social domain. In this presentation we will explore other models which may be more appropriate for these changing paradigms in healthcare research.

## TO SIT OR STAND – THAT IS THE QUESTION

**Callaghan J<sup>1</sup>**

<sup>1</sup>Applied Health Sciences, University of Waterloo, Waterloo, Canada

OHP1, Meeting Room C3.3, October 19, 2017, 10:35 AM - 11:20 AM

### Outline:

Sitting and the associated negative health outcomes have gained a lot of media attention recently, resulting in a threefold increase in public attention to the topic over the past 5 years. Sitting has been made out as a major health concern, leading to workers with seated jobs negotiating for the right to stand, but paradoxically, workers required to stand have been appealing for the right to sit. As physiotherapists, ergonomists and musculoskeletal disorder prevention practitioners know, there are potential negative outcomes of both prolonged standing and sitting. Based on the accepted practice of job rotation, sitting and standing appear to complement each other providing gross changes in posture. How this rotation is achieved can dramatically impact the low back pain responses of individuals. With individuals who develop acute transient pain to standing having a 300% higher rate of becoming future low back pain clinical cases. Although even a small reduction of sitting time has been shown to reduce musculoskeletal discomfort, from an overall health perspective, the ratio to aim for is a balanced time between standing and sitting. A key consideration is the frequency with which workers change positions. Changing positions often, even if total sitting time is not reduced, can result in health benefits, including reduced low back pain. Sit-stand workstations that allow workers to periodically alternate between sitting and standing positions may mitigate work-related health issues, both from prevention and accommodation perspectives, provided that users are given training along with the equipment.

### Key Practice Points:

- Integrating sitting and standing can prevent musculoskeletal pain and be used to accommodate LBP return to work individuals
- Specific strategies to accommodate pain developers will be presented
- Potential screening approaches to identify pain developers/clinical low back pain cases will be discussed.

## DEPRESSION IS ASSOCIATED WITH POORER SELF-MANAGEMENT FOR PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) COMPLETING PULMONARY REHABILITATION.

**Blackstock F<sup>1</sup>**, Webster K<sup>2</sup>, McDonald C<sup>3</sup>, Smith S<sup>4</sup>, Hill C<sup>5</sup>

<sup>1</sup>Physiotherapy, Western Sydney University, Campbelltown, Australia, <sup>2</sup>Physiotherapy, School of Allied Health, La Trobe University, Melbourne, Australia, <sup>3</sup>Department of Respiratory and Sleep Medicine, Austin Health, Heidelberg, Australia, <sup>4</sup>Nursing Research Centre, School of Nursing and Midwifery, Western Sydney University, Campbelltown, Australia, <sup>5</sup>Department of Physiotherapy, Austin Health, Heidelberg, Australia

R5-1, Meeting Room C4.2, October 19, 2017, 10:35 AM - 11:20 AM

### Aim:

To determine associations between physical or psychosocial domains of health and self-management behaviours for people enrolled in pulmonary rehabilitation with COPD.

### Design:

Cross-sectional cohort study.

### Method:

One-hundred and seventy-six participants (mean age 78±8.8, mean FEV1%predicted 58±22) involved in an RCT examining the role of education in a standard 8-week pulmonary rehabilitation program.

### Outcome measures:

Self-management (the Health Education Impact Questionnaire) and demographic information (age, gender, education level, socio-economic level, lung function, quality of life, exercise capacity, and healthcare use) were collected prior to commencing pulmonary rehabilitation. The association between self-management behaviours and personal characteristics was examined by Spearman's Rho correlation coefficient and predictors of self-management engagement determined with a regression analysis. P was set at <0.05.

### Results:

Moderate associations were found between poorer self-management, and anxiety, depression and lower quality of life (mastery, emotion and fatigue). Small associations were found between poorer self-management and lower self-efficacy, current smoking, dyspnoea, and poorer exercise capacity. Depression was found to be a significant predictor of poorer self-management behaviours. There was no association between self-management and hospital admissions, age, FEV1/FVC, sex, level of education, or socioeconomic status.

### Conclusion/Key Practice Points:

- Poorer mental health and well-being, particularly depression, is associated with poorer self-management for people with COPD.
- Interventions targeted at improving self-management behaviours, including pulmonary rehabilitation, may be strengthened by the inclusion of a core component addressing confidence and mental health.

## EXERCISE MAY NOT BE EFFECTIVE IN IMPROVING ACTIVITY AND REDUCING IMPAIRMENTS DURING UPPER LIMB FRACTURE REHABILITATION

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<sup>1</sup>La Trobe University, Melbourne, Australia, <sup>2</sup>Northern Health, Melbourne, Australia, <sup>3</sup>Victoria University, Melbourne, Australia, <sup>4</sup>Eastern Health, Melbourne, Australia

R5-1, Meeting Room C4.2, October 19, 2017, 10:35 AM - 11:20 AM

### Aim:

To evaluate the effect of exercise on increasing activity and reducing impairment in people after upper limb fractures.

### Design:

A systematic review including controlled trials published until July 2016 updating a previous review that searched to January 2011.

#### Method:

The review included adults after any upper limb fracture prescribed exercise, including trials where exercise was delivered to both groups but in varying amounts.

#### Results:

Searching eight electronic databases (CINAHL, MEDLINE, Embase, AMED, SPORT Discus, PubMed, PEDro and the Cochrane Central Register of Controlled Trials) identified nine relevant trials, which combined with the previous review totalled 23 studies (22 separate trials). Four trials evaluated the independent effect of exercise after an upper limb fracture. The remaining 18 trials included varying amounts of exercise, either in type of training (impairment or activity focused), level of therapist supervision (supervised or non-supervised training), volume or timing (early exercise and reduced immobilisation time). Less than 40% of included trials reported adequate exercise program description to allow replication according to the TiDier checklist. There was insufficient evidence (16 trials) to support the use of exercise, moderate evidence (5 trials) to support starting exercise and mobilisation early, and preliminary evidence (1 trial) that exercise of the non-injured arm during immobilisation may improve strength of the fractured arm during upper limb fracture rehabilitation.

#### Conclusion/Key Practice Points:

- Current prescribed exercise regimens may not be effective in improving activity and reducing impairments after an upper limb fracture.
- It may be beneficial to start mobilisation and exercise earlier.

#### THE IMPACT OF CONCEALED IDENTITY ON THE FIDELITY AND UTILITY OF LOW COST PEER SIMULATION: A RANDOMISED, CONTROLLED TRIAL

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<sup>1</sup>Monash University, Frankston, Australia

R5-1, Meeting Room C4.2, October 19, 2017, 10:35 AM - 11:20 AM

#### Aim:

Evolving pressure on patient access has prompted educators to investigate the utility of simulation in training physiotherapy students. Peer simulation engages fellow students to portray the patient role as simulated patients, potentially providing high level skill transfer with low cost and adequate fidelity. This study aimed to determine if concealing 'patient' identity during peer simulation:

- 1) Enhanced students' perception of the value of peer simulation
- 2) Improved student performance in preparation for clinical placement

#### Design:

Randomised controlled trial with assessor blinding

#### Method:

Consented third year students (n=91) were randomised into two groups during peer simulation. The 'patients' in the intervention group wore masks that concealed identity and costumes. The control group wore costumes only.

#### Data collection:

- Surveys investigating student perceptions of the value of simulation.
- Students submitted video clips of a patient interaction using each other as 'patients' pre and post intervention. Both clips were rated by an independent assessor.

#### Results:

Preliminary results indicate that concealing identity had a significant effect on students' ability to identify patients' key problems, establish goals, develop a treatment plan ( $p = 0.04$ ) and deliver treatment ( $p = 0.02$ ). Concealing identity had a near significant effect on students' perception of realism of the interaction ( $p = 0.05$ ) and a significant effect on self-reported behaviour change when playing both the physiotherapist ( $p = 0.03$ ) and patient ( $p = 0.03$ ) role.

Conclusion:

Peer simulation with concealed 'patient' identity may enhance realism and role portrayal and help students develop key clinical skills in preparation for clinical placement.

**SAGITTAL SPINE SHAPE LITERACY IN THE GENERAL ADULT POPULATION, ASSESSED BY A SIMPLE GRAPHICAL TOOL.**

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<sup>1</sup>University Of Sydney, Lidcombe, Australia

R5-1, Meeting Room C4.2, October 19, 2017, 10:35 AM - 11:20 AM

Aim:

To evaluate sagittal spine shape literacy, and associated back pain, using a novel graphical assessment tool.

Design:

Randomised cross-sectional crossover study involving selecting and free-hand drawing the ideal sagittal spine shape. Spine shape literacy was rated from 0 (least correct: lumbar kyphosis, thoracic lordosis) to 8 (most correct: lumbar lordosis, thoracic kyphosis). Demographic and back pain data was also collected.

Method:

Participants [N = 250, mean age: 40 years (SD:18), 53% female] were recruited through targeted and broad-based strategies. Drawing and selection responses, test and rater agreement and group trend associations were evaluated by Fisher's exact tests, Kendall's concordance coefficient (W), kappa (k) and  $\chi^2$  tests respectively.

Results:

A greater proportion of participants drew, rather than selected, the correct spine shape (30% vs 21%,  $p = 0.02$ ), but no difference was observed with lumbar lordosis literacy (37% vs 33%,  $p = 0.39$ ). The drawing and selection tests exhibited poor concordance ( $W = 0.11$ ). The good inter ( $k = 0.73$ ) and intra ( $k = 0.76$ ) rater agreement for the nine option drawing test improved to excellent for binary lordosis / no lordosis ( $k = 0.85$ ) and correct / incorrect ( $k = 0.84$ ) options. Participants reporting spinal pain demonstrated poorer shape selection ( $p = 0.02$ ).

Conclusion:

Since 70% of the cohort didn't depict the, spine pain associated, ideal sagittal spine shape, a population education program should be considered. Whilst the methods aren't interchangeable, the drawing test can immediately and easily be translated into clinical practice to enhance patient education and treatment.

**SLOW WALKING SPEED IS ASSOCIATED WITH HIGH SITTING TIME IN STROKE SURVIVORS: A DATA POOLING STUDY**

Hendrickx W<sup>1,2</sup>, Riveros C<sup>3</sup>, **English C<sup>2</sup>**

<sup>1</sup>Physical Therapy Sciences, Program in Clinical Health Sciences, University Medical Centre Utrecht, Utrecht, The Netherlands, <sup>2</sup>School of Health Sciences and Priority Research Centre for Stroke and Brain Injury University Of Newcastle, Newcastle, Australia, <sup>3</sup>Bioinformatics, Hunter Medical Research Institute, Newcastle, Australia

R5-1, Meeting Room C4.2, October 19, 2017, 10:35 AM - 11:20 AM

Aim:

To identify factors associated with high sitting time in stroke survivors.

Design:

Secondary exploratory analysis of individual participant data from nine original studies.

Method:

Through systematic searches we identified all published and ongoing trials of community dwelling stroke survivors that collected objective sitting time data using the activPAL monitor and invited authors to contribute original data. Algorithms were created to identify sleep-wake time and determine percentage of waking hours

spent sitting. Demographic and outcome data from individual studies were combined and missing data mapped. We explored factors associated with sitting time first via univariate analyses (controlling for age, gender and study), then via multivariate regression analyses.

#### Results:

A total of 274 participants had at least three days of valid data (> 10 hours of wake-wear time). Body Mass Index ( $p = 0.048$ ), degree of independence in activities of daily living ( $p = 0.014$ ), stroke severity ( $p = 0.035$ ), walking speed ( $p < 0.001$ ), walking aid use ( $p < 0.001$ ), anxiety ( $p = 0.028$ ) and walking capacity ( $p < 0.001$ ) were significantly associated with percentage of waking hours spent sitting in univariate analyses. Only walking speed ( $p = 0.002$ ) remained significant in the final multivariate regression (adjusted  $r^2 = 16.3\%$ ).

#### Conclusion/key practice points:

- Walking ability is significantly associated with high sitting time after stroke.
- The variability in sitting time is largely unaccounted for by demographic and stroke-related variables.
- Interventions to reduce sitting time will need to focus on behaviour change strategies.

### PERIPHERAL NERVE EXCITABILITY PROFILE IN PEOPLE WITH EARLY-ONSET TYPE 2 DIABETES MELLITUS WITHOUT CLINICAL SYMPTOMS OF NEUROPATHY

**Gu Y<sup>1</sup>**, Lee M<sup>2</sup>, Dennis S<sup>1,3,4</sup>, Wong J<sup>5</sup>, Gauld A<sup>5</sup>, Harmer A<sup>1</sup>

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R5-1, Meeting Room C4.2, October 19, 2017, 10:35 AM - 11:20 AM

#### Aim:

To evaluate peripheral nerve excitability profile in people with early-onset type 2 diabetes mellitus (diagnosed before 40 years of age) with no clinical symptoms of peripheral neuropathy compared with healthy age-matched controls.

#### Design:

We present preliminary baseline data of peripheral nerve function from a randomised controlled trial with concealed allocation.

#### Method:

The study uses the highly sensitive method of nerve excitability testing to detect subtle changes in peripheral sensory and motor nerve function, and to identify the mechanism of any dysfunction. Four participants with early-onset type 2 diabetes (recruited from a tertiary hospital diabetes clinic) underwent median nerve motor and sensory axonal excitability studies. The results are compared with those of five age-matched healthy controls. Unpaired two-tailed t-tests were used to compare group differences in nerve excitability parameters.

#### Results:

Preliminary data show participants with early-onset type 2 diabetes have a trend for reduced sensory nerve action potential ( $\mu V$ ) (mean  $\pm$  SD, healthy  $53.3 \pm 15$ , diabetes  $40.5 \pm 20$ ,  $p = 0.32$ ); reduced motor nerve threshold electrotonus depolarization at 40% compound muscle action potential (ms) (healthy  $22 \pm 5$ , diabetes  $20 \pm 3$ ,  $p = 0.6$ ); and increased rheobase (mA) of both motor (healthy  $2.6 \pm 0.8$ , diabetes  $4.6 \pm 1.5$ ,  $p = 0.1$ ) and sensory nerve (healthy  $1.4 \pm 0.7$ , diabetes  $1.9 \pm 0.9$ ,  $p = 0.6$ ).

#### Conclusion:

Preliminary data demonstrate possible dysfunction of sodium channels in peripheral nerve among people with early-onset type 2 diabetes who have no clinical symptoms of neuropathy.

## THE EXPERIENCES OF PHYSIOTHERAPISTS PROMOTING NON-TREATMENT PHYSICAL ACTIVITY IN PRIVATE PRACTICE AND OUTPATIENT SETTINGS: PRELIMINARY RESULTS FROM A QUALITATIVE STUDY.

**Kunstler B<sup>1</sup>**, Cook J<sup>2</sup>, O'Halloran P<sup>2</sup>, Kemp J<sup>2</sup>, Finch C<sup>3</sup>

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R5-1, Meeting Room C4.2, October 19, 2017, 10:35 AM - 11:20 AM

### Aim:

Report the preliminary results of interviews exploring the experiences of physiotherapists when promoting non-treatment physical activity (NTPA) for the purposes of general health.

### Design:

Qualitative study.

### Method:

Semi-structured interviews were completed with 10 physiotherapists primarily treating patients with musculoskeletal complaints in Australian metropolitan and regional private practice and outpatient settings. Physiotherapists were recruited using social media and snowballing methods. Interviews were conducted face-to-face, by telephone and using Skype. Interpretative phenomenological analysis was used to guide study design and data analysis. NVivo was used to assist with the organisation of data.

### Results:

Four themes have been identified in the preliminary stages of analysis: (1) the role physiotherapists have in health and NTPA promotion; (2) patient expectations; (3) preserving the clinician-patient relationship; and (4) restrictions specific to the workplace context, including not overstepping professional boundaries.

### Conclusion/Key Practice Points:

- These preliminary data suggest physiotherapists feel it's their role to promote NTPA to patients.
- However, several factors can influence their decision to promote NTPA (e.g. avoiding overstepping professional boundaries) and their promotion methods (e.g. using a conservative approach).
- Findings from this study will support future research into the ways to improve NTPA promotion in physiotherapy practice.

## LIMITED FLUID INTAKE AND RESTRICTED TOILETING ARE ASSOCIATED WITH REDUCED WORK PRODUCTIVITY FOR WOMEN WITH URINARY STORAGE SYMPTOMS AT WORK

**Pierce H<sup>1</sup>**, Perry L<sup>1,4</sup>, Gallagher R<sup>1,2</sup>, Chiarelli P<sup>3</sup>

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R5-1, Meeting Room C4.2, October 19, 2017, 10:35 AM - 11:20 AM

### Aim:

To examine the relationship between limited fluid intakes, restricted toileting and work productivity for female nurses and midwives with urinary storage symptoms at work.

Design: Cross-sectional observational study.

### Method:

A survey was distributed to 600 female nurses and midwives at three urban hospitals, June to November 2016. Logistic modeling was used to estimate the predictive association between limited fluid intake, restricted toileting and urinary specific work impairment. The productivity domains examined were time management, mental concentration and physical demands. The models were adjusted for age, body mass index, back pain, anxiety, depression and other pelvic floor dysfunctions.

### Results:

In total 77.1% (95% CI: 73-81) of the included sample (n=353) delayed voiding at work, 22.4% (95% CI: 18-27) were not able to access the toilet when required, and 26.9% (95% CI: 22-32) reduced their fluid intake to delay or avoid voiding at work. The prevalence of urinary storage symptoms at work was 46.7% (95% CI: 42-52). Those who limited fluids were more likely to have time management impairment than those who didn't (OR: 3.68; 95% CI: 1.58-8.61). Those who delayed voiding at work were more likely to have concentration impairment than those who didn't (OR: 8.80; 95% CI: 1.07-72.16). Study limitations include the potential for uncontrolled confounding; sampling and response effects may have biased findings.

**Conclusion/Key Practice Points:**

- Limitation of fluids and restricted toileting are modifiable behaviours, hence associated presenteeism loss preventable.
- Barriers to healthy behaviours should be investigated.
- Continence education has a place in occupational health.

## CONCUSSION IN SPORT: WHERE ARE WE NOW?

**Makdissi M**

SPA1, Darling Harbour Theatre, October 19, 2017, 10:35 AM - 11:20 AM

Concussion is a hot topic in sports medicine, and clinicians managing athletes with concussion are required to be fully informed of the most up-to-date principles in assessment and management. The recent international meeting and resulting consensus statement and concussion assessment tools have provided uniform guidance for how concussion should be managed across sports and sporting codes. This keynote presentation will provide clinicians with an overview of the current landscape of concussion management in sports medicine, with a particular focus on evidence-based care.

## EFFECTIVE CLINICAL ASSESSMENT AND MANAGEMENT OF CONCUSSION IN ATHLETES

**Di Leva A**

SPA1, Darling Harbour Theatre, October 19, 2017, 10:35 AM - 11:20 AM

Concussion assessment and management is a continually evolving science. Concussions are an inevitable injury of high-risk sports, which the medical team needs to be prepared and well-equipped to effectively manage. This session focuses on practical, evidence based, therapeutic approaches to the assessment and management of acute sport-related concussion in clinic. Physiotherapists are well-positioned with multiple patient contact points to play an essential role in the assessment and management of concussion. From initial assessment, education and guidance, to the identification of slowed progression, physiotherapists can manage patients throughout their recovery and apply the most timely and appropriate treatments.

## THE EFFECT OF EXERCISE DURING PREGNANCY IN NORMAL AND OVERWEIGHT WOMEN

**Mørkved S<sup>1,2,3</sup>**

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WMPH1, Meeting Room C4.4, October 19, 2017, 10:35 AM - 11:20 AM

Recommendations on physical activity and exercise training during pregnancy have previously been based mainly on social and cultural notions. Pregnancy was considered a vulnerable period, in which physical activity and especially exercise training could put both mother and fetus at risk. Recently, research has provided increased knowledge on the positive effects and safety of physical activity and exercise training during pregnancy. Today women are recommended to be physically active during pregnancy and the postpartum period to maintain a healthy weight, and to prevent negative health outcomes. Exercise training during pregnancy may lower the risk of developing type 2 diabetes among women with previous gestational diabetes mellitus (GDM). While physical inactivity during pregnancy is an independent factor associated with

maternal obesity, GDM and pregnancy complications. In the case of a normal, healthy pregnancy, research clearly shows positive effects of regular exercise during pregnancy.

A systematic review by Perales (2016) reported significant effects of exercise training on cardiorespiratory fitness and urinary incontinence in late pregnancy. Some trials reported lower gestational weight gain (GWG) in the exercise groups. In a meta-analysis Wiebe (2015) reported that exercise was associated with 31% less risk of having a newborn  $\geq 4000$  g, with lower GWG and reduced risk of gestational diabetes mellitus (GDM). Two systematic reviews (Sui 2012; Magro-Molasso 2016) including only overweight and obese women, found a positive effect on GWG and lower risk of preterm birth and for developing GDM.

### 'MOVE BABY MOVE': EXERCISE IMPROVES GLYCAEMIC CONTROL IN WOMEN WITH GESTATIONAL DIABETES MELLITUS: A SYSTEMATIC REVIEW

**Harrison A**<sup>1,2</sup>, Shields N<sup>2,3</sup>, Taylor N<sup>2,4</sup>, Frawley H<sup>5,6</sup>

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WMPH1, Meeting Room C4.4, October 19, 2017, 10:35 AM - 11:20 AM

#### Aim:

To investigate whether exercise improves postprandial glycaemic control in women diagnosed with gestational diabetes mellitus.

#### Design:

A systematic review with meta-analysis of randomised, controlled trials.

#### Method:

Participants were pregnant women diagnosed with gestational diabetes mellitus. The intervention was exercise, performed more than once a week, sufficient to achieve an aerobic effect or changes in muscle metabolism. Outcome measures included postprandial blood glucose, fasting blood glucose, glycated haemoglobin, requirement for insulin, adverse events and adherence.

#### Results:

Eight randomised, controlled trials (588 participants) were included; seven of these trials (544 participants) had data suitable for meta-analysis. Five trials scored  $\geq 6$  on the PEDro scale, indicating relatively high methodological quality. Meta-analysis showed that exercise, as an adjunct to usual care, significantly improved postprandial glycaemic control (MD -0.33 mmol/L, 95% CI -0.49 to -0.17) and lowered fasting blood glucose (MD -0.31 mmol/L, 95% CI -0.56 to -0.05) when compared with standard care alone, with no increase in adverse events. Effects of similar magnitude were found for aerobic and resistance exercise programs, if performed at a moderate intensity or greater, for 20 to 30 minutes, three to four times per week. All studies reported that complications or other adverse events were either similar or reduced with exercise.

#### Conclusion/Key Practice Points:

- Adding exercise to usual care of gestational diabetes mellitus safely helps to control postprandial blood glucose levels and other measures of glycaemic control.
- Exercise may assist in reducing maternal and neonatal complications in gestational diabetes mellitus.

### CHANGES IN FEAR OF CHILDBIRTH FOLLOWING HYPNOBIRTHING EDUCATION: A REPEATED MEASURES, DESCRIPTIVE COHORT STUDY

**Shiel E**<sup>1</sup>, Tarca R<sup>1</sup>, Ireland - Naughton N<sup>1</sup>, Thompson J<sup>1</sup>, Jaques A<sup>1</sup>, Briffa N<sup>1</sup>

<sup>1</sup>Curtin University, Australia

WMPH1, Meeting Room C4.4, October 19, 2017, 10:35 AM - 11:20 AM

#### Aim:

To observe how fear of childbirth changes following hypnobirthing education and to examine the relationship between fear of childbirth and birthing outcomes.

**Design:**

An observational, repeated measures study design.

**Method:**

Volunteers were 33 Australian women (79% first time mothers) who had chosen to participate in a hypnobirthing antenatal education course. Fear of childbirth was measured using the Wijma Delivery Expectancy/Experience Questionnaire a) at baseline (n=33), b) straight after the hypnobirthing course (n=22) and, c) two to six weeks postpartum (n=19). The Childbirth Experience Questionnaire and three open-ended questions related to the birthing experience were also administered postpartum.

**Results:**

Baseline fear of childbirth was spread evenly between low (33%), medium (36%) and high fear (30.3%). Women achieved a significant reduction in their fear of childbirth scores following hypnobirthing education with a mean (95%CI) decrease of 31.3 points (20.7-42.1), which meant 82% of women scored in the low fear category following education. There was a small increase in scores post-partum but they remained 25.5 (11.8-39.2) points lower than baseline scores. No significant relationships were found between baseline fear of childbirth scores and parity, maternal age, gestational age, education or previously diagnosed anxiety and/or depression. Hypnobirthing correlated significantly with birth satisfaction in the domain of 'perceived safety' ( $\rho=0.88$ ,  $p<0.001$ ) and women also reported an improved preparedness and increased confidence in their ability to birth.

**Conclusion/Key Practice Points:**

- Hypnobirthing childbirth education is a model of antenatal education that can be used to reduce fear of childbirth in Australian pregnant women.

**RIPPLES TO WAVES: PRESCRIBING AND MONITORING CARDIOVASCULAR EXERCISE IN CHRONIC CONDITIONS**

**McNamara R<sup>1</sup>**

<sup>1</sup>Prince of Wales Hospital, Sydney, Australia

AG2, Meeting Room C3.5, October 19, 2017, 11:25 AM - 12:10 PM

Cardiovascular exercise is vitally important for people with chronic conditions to manage their symptoms, prevent health deterioration, and optimise their physical performance on land. Water-based cardiovascular exercise is often more suitable in the initial stages of rehabilitation programs, and especially in people with chronic disease who have difficulties with, or are unable to, exercise on land. However, there is often little emphasis on including cardiovascular exercise in an aquatic program, and ensuring the intensity is appropriately prescribed and adequately monitored.

This presentation will provide an overview of systematic reviews and studies examining cardiovascular exercise in people with musculoskeletal, neurological and cardiorespiratory conditions, and will discuss the evidence for exercise prescription and highlight the limitations in descriptions of interventions. Practical methods for prescribing and monitoring cardiovascular exercise in the water will be discussed.

**Key Practice Points:**

- Appropriate prescription of cardiovascular exercise in the water is important and achievable in clinical practice
- Measuring the intensity of cardiovascular exercise in water is feasible.

## AQUATIC EXERCISE FOR PEOPLE WITH TYPE 2 DIABETES

**Scheer A<sup>1</sup>**, Naylor L<sup>2</sup>, Charlesworth J<sup>3</sup>, Gan S<sup>4</sup>, Benjanuvatra N<sup>2</sup>, Green D<sup>2</sup>, Maiorana A<sup>1</sup>

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AG2, Meeting Room C3.5, October 19, 2017, 11:25 AM - 12:10 PM

### Aim:

To determine whether aquatic exercise improves health and fitness in people with type 2 diabetes.

### Design:

Controlled trial, with baseline, intervention and follow up.

### Method:

Participants with type 2 diabetes underwent eight weeks of aquatic exercise training (n=13) or a control period (n=14). Training involved water-based circuit training, performed for one hour, three times per week at 60 to 80% of heart rate maximum. Peak oxygen consumption (VO<sub>2</sub>peak) during cycle ergometry, one repetition maximum muscle strength (leg press and pectoral deck), vascular endothelial function (flow mediated dilation), anthropometry and blood profiles (lipids and glycaemic control) were assessed.

### Results:

Aquatic training increased VO<sub>2</sub>peak ( $18.5 \pm 4.3$  to  $21.5 \pm 5.4$  ml/kg/min) compared with controls ( $20.3 \pm 4.3$  to  $19.5 \pm 3.8$  ml/kg/min) ( $p = 0.002$ ). Leg strength increased ( $92 \pm 28$  to  $104 \pm 29$ kg) compared with controls ( $83 \pm 33$  to  $82 \pm 33$ kg) ( $p = 0.001$ ). Improvement in pectoral muscle strength ( $31 \pm 17$  to  $35 \pm 16$ kg) was not significantly different to controls ( $24 \pm 12$  to  $26 \pm 14$ kg controls) ( $p = 0.08$ ). Endothelial function increased slightly following training ( $6.0 \pm 2.4$  to  $6.5 \pm 3.0\%$ ) compared with a decrease in controls ( $6.2 \pm 1.6$  to  $5.4 \pm 1.6\%$ ) ( $p = 0.002$ ). No significant between group differences were observed in anthropometric measurements or blood profiles.

### Conclusion/ Key Practice Points:

- Aquatic circuit training is effective for improving strength and fitness in people with type 2 diabetes and may help to maintain endothelial function and vascular health.

## SHOW JUMPING BIOMECHANICS – WHAT DO WE KNOW AND HOW CAN IT BE USEFUL IN A PHYSIOTHERAPY SETTING?

**Mathlin E<sup>1</sup>**, Dean K<sup>1</sup>

<sup>1</sup>*Equimotion, Sydney*

APG2, Meeting Room C3.4, October 19, 2017, 11:25 AM - 12:10 PM

An overview of the principles of show jumping biomechanics will be provided and then a brief review of current literature will be covered including important performance factors in the horse jump, and the effect of the rider on the horse's jump. The aim for participants is to gain an understanding of show jump biomechanics, why it is relevant for physiotherapists to assess the whole movement pattern of horse and rider, and how the use of high speed video kinematic analysis can bridge the gap between physiotherapy clinical practice and improving the performance of the equestrian athlete.

## THE FUNCTIONAL DISABILITY QUESTIONNAIRE: EVALUATION OF THE CLINIMETRIC PROPERTIES OF A NEW TOOL FOR MEASURING PHYSICAL FUNCTION FOLLOWING CARDIAC SURGERY

**Md Ali K<sup>1</sup>**, Denehy L<sup>1</sup>, Granger C<sup>1</sup>, Royse A<sup>2</sup>, Royse C<sup>2</sup>, Logie S<sup>3</sup>, Sturgess T<sup>4</sup>, McManus M<sup>5</sup>, Clarke S<sup>6</sup>, El-Ansary D<sup>1</sup>

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CRP2A, Meeting Room 4.6, October 19, 2017, 11:25 AM - 12:10 PM

### Aims:

To develop a shortened version of the Functional Disability Questionnaire (FDQ) and determine its clinimetric properties to measure physical function in patients following cardiac surgery.

Design: Multi-site observational study.

### Methods:

225 participants following cardiac surgery via a median sternotomy were included. Participants completed the original 13-item FDQ pre-hospital discharge; and four weeks and three months post-operatively for the evaluation of factor structure and internal consistency. A shortened version (FDQ-s) was developed. The clinimetric properties of the FDQ-s including the reliability, validity, predictive utility, responsiveness, and minimal clinical important difference (MCID) were evaluated in sub-groups of participants. Participants also completed alternative measures of physical function, pain and health-related quality of life before hospital discharge, and at four weeks and three months post-operatively.

### Results:

Exploratory factor analysis of the FDQ supported the construct validity of the final item-scale structure. Item reduction resulted in the creation of a 10-item shortened version of the questionnaire (FDQ-s). The FDQ-s had excellent test-retest reliability (intra-class correlation 0.89-0.92); excellent internal consistency (Cronbach's alpha coefficient > 0.90); and fair to excellent construct validity (> 0.4). Performance in the FDQ-s at hospital discharge was predicted by pain at the same time-point (Odd ratio 0.412, 95% CI 1.54 to 6.00, p=0.01). The FDQ-s had strong responsiveness overtime with large effect sizes (Cohen's d > 1.0). The MCID of the FDQ-s was calculated as 4 to 10 out of 100cm.

### Conclusions/Key Practice Points:

- The FDQ-s is an appropriate test to evaluate physical function in patients following cardiac surgery.

## AUSTRALIAN CLINICIANS' OPINIONS AND PRACTICES FOR ENCOURAGING SMOKING CESSATION IN CARDIOTHORACIC SURGERY.

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CRP2A, Meeting Room C4.6, October 19, 2017, 11:25 AM - 12:10 PM

### Aim:

To identify the opinions and practices of cardiothoracic surgeons, anaesthetists, nursing and physiotherapy staff towards smoking cessation and tobacco harm reduction during the perioperative period, a critical 'teachable moment'.

### Design:

A qualitative study using in-depth, semi-structured open-ended interviews.

### Methods:

52 clinicians (15 consultant surgeons, 15 consultant anaesthetists, 11 physiotherapists, and 11 nurses) from six hospitals in Sydney, NSW were recruited using purposive sampling, and interviewed between October 2015 and November 2016. Interviews were audio recorded and verbatim transcripts were examined using thematic framework analysis and NVivo software.

#### Results:

All clinicians supported the need for smoking cessation advice to reduce postoperative morbidity. Their advice focused on physiological risks of continued cigarette use and opinions and practices were influenced by patient cohort and belief about addiction. Advice was modified depending on surgery type and time of preoperative assessment and the experience and type of healthcare professional. Factors that adversely affected the delivery, interventions and support offered were lack of time and resources, and variance in follow up beyond hospital discharge. There was a lack of formal training and an overall lack of awareness of NSW Health brief intervention model (5As).

#### Conclusion/Key Practice Points:

- The results of this study highlight the importance clinicians place on smoking cessation advice in the perioperative period and their ongoing efforts sustained by knowledge gained through experience, rather than formal clinical education.
- There is a need for providing adequate resources and smoking cessation training to all clinicians involved in the perioperative care of the cardiothoracic surgical patient.

### DEVELOPMENT OF PULMONARY REHABILITATION GUIDELINES FOR AUSTRALIA AND NEW ZEALAND

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CRP2B, Meeting Room C4.7, October 19, 2017, 11:25 AM - 12:10 PM

#### Aim:

To provide evidence-based recommendations for the practice of pulmonary rehabilitation specific to Australian and New Zealand healthcare contexts.

#### Design:

Systematic reviews

#### Methods:

The Guideline methodology adhered to the Appraisal of Guidelines for Research and Evaluation (AGREE) II criteria. Systematic reviews were undertaken for nine PICO (Population, Intervention, Comparator, Outcome) questions and recommendations made with the strength of each recommendation based on the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) criteria. The Guidelines were externally reviewed by a panel of experts.

#### Results:

The Guideline panel recommended that people with mild to severe chronic obstructive pulmonary disease (COPD) should undergo pulmonary rehabilitation to improve quality of life and exercise capacity and to reduce hospital admissions; that pulmonary rehabilitation could be offered in hospital gyms, community centres or at home, and could be provided irrespective of the availability of a structured education program; that pulmonary rehabilitation should be offered to people with bronchiectasis, interstitial lung disease and pulmonary hypertension, with the latter in specialised centres. Due to insufficient evidence, the Guideline panel was unable to make recommendations relating to: pulmonary rehabilitation program length beyond eight weeks; optimal model for maintenance after pulmonary rehabilitation; use of supplemental oxygen during exercise training. The Guideline document discussed the need for culturally appropriate pulmonary rehabilitation programs for Indigenous people with COPD.

Conclusion/Key Practice Points:

- The Australian and New Zealand Pulmonary Rehabilitation Guidelines present an evaluation of the evidence for questions related to pulmonary rehabilitation
- The recommendations provide guidance for clinicians and policy makers.

COMPARISON OF A MINIMAL EQUIPMENT, COMMUNITY-BASED PULMONARY REHABILITATION PROGRAM TO A TRADITIONAL HOSPITAL-BASED PULMONARY REHABILITATION PROGRAM. A RETROSPECTIVE ANALYSIS

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CRP2B, Meeting Room C4.7, October 19, 2017, 11:25 AM - 12:10 PM

Aim:

To determine if a minimal equipment, community-based pulmonary rehabilitation program has comparable effects on exercise capacity and quality of life to a traditional hospital-based pulmonary rehabilitation program.

Design:

A retrospective, multi-site cohort study.

Method:

A retrospective analysis was performed to review outcome data from all patients that attended a minimal equipment, community-based program and a hospital-based program in the same geographic location, provided by clinicians from the same service. Both pulmonary rehabilitation programs consisted of twice weekly exercise for eight to ten weeks with disease management education. At baseline and following training, exercise capacity and quality of life were measured by the six-minute walk test and the St George's Respiratory Questionnaire respectively.

Results:

Data from 93 participants (mean [SD]: age 75 [9] years; 53% COPD: FEV<sub>1</sub> 61 [23] % predicted; females: 43%) that attended the community-based program and 101 participants (mean [SD]: age 74 [11] years; 60% COPD: FEV<sub>1</sub> 58 [23] % predicted; females 63%) that attended the hospital-based program, in the previous two years were analysed. Fifty-two% and 46% of patients completed the community-based program and hospital-based program respectively. There were no significant between group differences in the six-minute walk test (mean difference 6 m, 95% CI -13 to 24) and St George's Respiratory Questionnaire total score (mean difference -3 points, 95% CI -8 to 2).

Conclusion/Key Practice Points:

- This retrospective analysis demonstrates that a minimal equipment, community-based pulmonary rehabilitation program achieves comparable benefits to a traditional hospital-based program despite the high drop-out rate in both programs.

THE ROLE OF PAIN IN PULMONARY REHABILITATION: A QUALITATIVE STUDY

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CRP2B, Meeting Room C4.7, October 19, 2017, 11:25 AM - 12:10 PM

Aim:

To explore the views of health care providers and individuals with chronic obstructive pulmonary disease on pain during pulmonary rehabilitation.

Design:  
Prospective, qualitative study.

Method:  
A qualitative study using inductive thematic analysis. Eighteen health care providers familiar with pulmonary rehabilitation and 19 patients with chronic obstructive pulmonary disease enrolled in pulmonary rehabilitation participated in semi-structured interviews, which were analysed using inductive thematic analysis.

Results: 1. Pain interfering with lung disease: dyspnoea causing thoracic pain, heightened by dyspnoea and anxiety. 2. Pain interfering with pulmonary rehabilitation: a. Communicating pain: health care providers emphasised the need for patients to report pain. However, patients are reluctant to do so for fear of being excluded from pulmonary rehabilitation. b. Pulmonary rehabilitation is a short-term aggravator but long-term reliever; pain hinders exercise completion and can lead to dropout, but can support pain coping in the long-term. c. Advice and strategies for pain: the direction from health care providers in pulmonary rehabilitation is to adapt or cease exercise. 3. A pain intervention: distraction, mindfulness and education were considered useful techniques to target pain in chronic obstructive pulmonary disease. The preferred delivery mode was group education at the start of pulmonary rehabilitation with one-on-one support if required. Health care providers recognised gaps in their knowledge regarding pain management.

Conclusion/Key Practice Points:

- A chronic obstructive pulmonary disease-specific pain intervention appears warranted to encourage pulmonary rehabilitation adherence and clinical benefit.
- An intervention could be provided within the existing pulmonary rehabilitation education program with appropriate health care provider training.

#### PAIN IN PEOPLE WITH CHRONIC BRONCHITIS/EMPHYSEMA: PREVALENCE AND ASSOCIATED SOCIO-DEMOGRAPHIC FACTORS

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CRP2B, Meeting Room C4.7, October 19, 2017, 11:25 AM - 12:10 PM

Aim:

To: 1) determine whether pain prevalence differs between people with and without chronic bronchitis and/or emphysema (CB/E); 2) identify socio-demographic factors associated with presence of moderate/severe pain in people with CB/E.

Design:  
Cross sectional, secondary analysis.

Method:  
Data from adults aged ≥18 years who completed the 2011-12 (n = 15,136) and 2014-15 (n = 14,510) Australian National Health Survey (Australian Bureau of Statistics) were used to identify respondents self-reporting CB/E (minimum six months) with and without bodily pain in preceding four weeks. Multivariable logistic regression models were used to assess associations (Odds ratio, 95% confidence limits,  $p \leq 0.05$ ) between pain presence/severity and socio-demographic factors.

Results:  
Prevalence of CB/E was 3.6% (n = 1,081, female: male = 621:460). Pain prevalence differed between people with (84%) and without CB/E (69%) ( $p = <0.001$ ). In people with CB/E, there were significant associations for those reporting moderate/severe pain versus no/mild pain for low educational attainment ( $\leq$ Year 12: OR 2.41 95% CI 1.37 to 4.27,  $p < 0.01$ ), most severe socioeconomic disadvantage (OR 2.40, 95% CI 1.32- to .37,  $p < 0.01$ ), current smoker (OR 1.99, 95% CI 1.28 to 3.08,  $p < 0.01$ ), unmarried (OR 0.59 95%CI 0.42 to 0.83,  $p = 0.003$ ) and employment (OR 0.53 95%CI 0.37 to 0.75,  $p < 0.001$ ). When models were adjusted for age/sex, employment status remained significant.

Conclusion/ Key Practice Points:

- Pain prevalence was greater in people self-reporting CB/E

- People with greatest socioeconomic disadvantage have the greatest risk of co-existence of pain and chronic respiratory disease.

#### THE EFFECTS OF LISTENING TO MUSIC DURING A CONSTANT SPEED ENDURANCE WALK TEST IN PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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CRP2B, Meeting Room C4.7, October 19, 2017, 11:25 AM - 12:10 PM

##### Aim:

Dyspnoea is the primary symptom limiting exercise tolerance in people with chronic obstructive pulmonary disease. One approach to reducing symptoms is through the provision of music listening during exercise. A high intensity, constant speed, endurance walk test is reflective of a high intensity exercise training session performed during pulmonary rehabilitation. However, the effect of listening to music during this form of exercise test is unknown.

##### Design:

Prospective, randomised cross-over trial.

##### Method:

Participants with chronic obstructive pulmonary disease completed two constant speed endurance walk tests in randomised order. During one condition, participants listened to self-selected music, with a choice of four music genres. During the second condition, no music was applied. The endurance time of each walking test was recorded, along with measures pre and post-test of heart rate, oxygen saturation, dyspnoea and leg fatigue (Borg scales).

##### Results:

Nineteen participants with COPD (mean age 71 years) completed the study. Thirteen participants usually listened to music during activity. Listening to music increased endurance time (mean difference of 1.1 minutes (95% CI 0.4 to 1.8) and reduced the level of dyspnoea (4.3 versus 5.3 points,  $p = 0.02$ ), with no effect on heart rate, oxygen saturation or leg fatigue post-test between conditions.

##### Conclusion/Key Practice Points:

- Listening to music during a high-intensity, constant speed endurance walk test increased endurance time and reduced dyspnoea in people with chronic obstructive pulmonary disease.
- Further study of the effects of listening to music during endurance and resistance training in pulmonary rehabilitation programs is warranted.

#### CAN A STUDENT'S ABILITY TO CRITICALLY SELF-REFLECT, PREDICT THEIR WORK-READINESS AS A PHYSIOTHERAPIST?

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EDU2, Meeting Room C4.11, October 19, 2017, 11:25 AM - 12:10 PM

##### Aim:

To investigate: i) if relationships exist between a student's critical reflective ability and their work readiness as a physiotherapist; and whether these relationships differ by gender.

##### Design:

A retrospective cohort study.

#### Method:

Critical reflection task (CRT) marks from all 5-week physiotherapy clinical placements and Assessment of Physiotherapy Practice (APP) scores of the final Clinical Internship (CIAPP) (as a measure of work-readiness) from 122 physiotherapy students (F=57, M=65) were analysed.

#### Results:

Musculoskeletal outpatient CRT's accounted for 5.4% ( $p < 0.010$ ) of the variance in the CIAPP scores for the total group. No significant relationships existed between the CIAPP scores and CRT marks for female students. Although weak, significant and educationally important relationships existed between Musculoskeletal Inpatient (Orthopaedics) and Musculoskeletal Outpatient CRT marks in males, accounting for approximately a full grade change, with 9.7% ( $p < 0.023$ ) and 9.4% ( $p < 0.013$ ) of the variance in the CIAPP scores, respectively. In the presence of all clinical subject CRT marks, the Musculoskeletal Outpatient CRT remained the only significant predictor of the CIAPP scores ( $R^2 = 0.121$ ;  $p = 0.011$ ) for male students.

#### Conclusions:

An educationally significant predictive relationship exists between Musculoskeletal Outpatient CRT marks and the CIAPP scores in males suggesting that males with poor CRT marks could be offered early remediation strategies to develop critical self-appraisal skills to improve work-readiness as a physiotherapist.

#### Key Practice Point:

- Critical self-reflection ability in first-year Musculoskeletal-outpatient placements account for approximately 10% of the variance in final clinical internship scores (APP).

### DESIGNING LEARNER-CENTRED IN-HOUSE PROFESSIONAL DEVELOPMENT PROGRAMS FOR CLINICAL EDUCATORS BASED ON THEIR BELIEFS OF TEACHING AND LEARNING.

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EDU2, Meeting Room C4.11, October 19, 2017, 11:25 AM - 12:10 PM

#### Aim:

To explore physiotherapy clinical educators' beliefs about teaching and learning and their preferences for development as educators to inform in-house clinical educator training.

#### Design:

The methodology was qualitative drawing from interpretivism, using a survey of clinical educators' teaching conceptions followed by focus groups, to further explore their responses.

#### Method:

Ethics approval was obtained from Human Research Ethics Committee, St Vincent's Hospital, Melbourne. Clinical educators completed the Conceptions of Teaching and Learning questionnaire. Two focus groups were conducted and participants were divided according to level of experience: early-career (less than five years) and experienced (five or more years). Focus groups were audio-recorded and thematically analysed by two independent researchers.

#### Results:

The survey response rate was 40/55 (73%) and 18/40 (45%) participants attended the focus groups. Two themes emerged from the data; most clinical educators valued active student participation when teaching and educator experience influenced teaching approach and training preferences. Early-career educators preferred training programs with close mentoring. Experienced educators preferred peer group discussions and more formal graduate education programs. The data demonstrated the diverse training needs of the participants.

#### Conclusion/ Key Practice Points:

- In-house professional development programs are likely to be more effective if they are learner-centred and designed to align with the contextual and experiential needs of participants.
- Content should be tailored to build explicitly on educators' conceptions of their role, their experience and beliefs about teaching.

- The results suggest that there is a need for diversity in methods of teaching clinical educators when designing professional development programs.

#### CLINICAL EDUCATORS' PREFERENCES REGARDING A PACKAGE TO AID IN THE TEACHING OF CLINICAL PREDICTION RULES TO STUDENTS ON CLINICAL PLACEMENT

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EDU2, Meeting Room C4.11, October 19, 2017, 11:25 AM - 12:10 PM

##### Aim:

To explore the key elements to be included in an educational package on Clinical Prediction Rules (CPRs) for musculoskeletal physiotherapy clinical educators, and to investigate preferences for presentation and delivery.

##### Design:

Qualitative research using individual and group semi-structured interviews.

##### Method:

Interviews explored clinical educators' preferences for an education package on CPRs including content and mode of delivery, while examining barriers (actual or perceived) to the implementation of CPRs in clinical practice and in teaching in the clinical setting. Purposive sampling recruited clinical educators (n=10) working in musculoskeletal physiotherapy in a variety of geographical and clinical settings. Participants were required to have some awareness of CPRs, though with varied experience as educators and in applying CPRs in clinical practice.

##### Results:

Participants were all supportive of an educational package. They expressed a variety of opinions as to the specific CPRs that should be included, but agreed that it should include general background information on the development and limitations of CPRs, and why CPRs are pertinent to current physiotherapy practice. Further, the mode of delivery of the education package should allow for various learning styles and preferences, including online and face-to-face tutorials, and electronic and hard-copy information.

##### Conclusion/Key Practice Points:

- Data from this sample suggests clinical educators would find an educational package useful to assist those teaching CPRs to students.
- Implementation of such a package may lead to students being more exposed to CPRs during their clinical training, thereby aiding them to prepare for contemporary practice in an evidence-based environment.

#### LONG-TERM HOME AND COMMUNITY-BASED EXERCISE PROGRAMS IMPROVE FUNCTION IN COMMUNITY-DWELLING OLDER PEOPLE WITH COGNITIVE IMPAIRMENT: A SYSTEMATIC REVIEW

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GPA2, Meeting Room C3.6, October 19, 2017, 11:25 AM - 12:10 PM

##### Aim:

To determine whether long term (> three months) home or community - based exercise programs improve function, reduce falls and prevent hospital readmissions in older people with cognitive impairment.

##### Design:

Systematic review and meta-analysis of randomised, controlled trials.

#### Method:

The study involved older adults (65 years) with cognitive impairment living in the community and measured the effect of long term home or community-based exercises (including aerobic training, resistance training, balance, walking, stretching or a combination of exercise types) on function (including balance and activities of daily living), falls and hospital readmissions.

#### Results:

Of 1011 studies identified, seven trials with 945 participants met the inclusion criteria. Compared with no intervention, long-term exercise programs improved functional independence in basic activities of daily living by a moderate and significant amount (SMD 0.77, 95% CI 0.17 to 1.37, I<sup>2</sup> = 67%), and improved functional independence in instrumental activities of daily living by a small and significant amount (SMD 0.44, 95% CI 0.03 to 0.86, I<sup>2</sup> = 42%). Long-term exercise improved balance (mean difference in functional reach test 5.2 cm, 95% CI 0.5 to 9.9, I<sup>2</sup> = 76%). However, there was limited reporting of the effect of exercise on hospital readmissions for this group of people.

#### Conclusion/Key Practice Points:

- Long-term exercise programs in the home or community show benefits in balance and in functional independence with basic activities (eg, dressing, feeding) and instrumental activities (eg, shopping, cleaning).
- Data from individual trials also show a reduction in falls in this population.

### THE MOMENTUM OF QUANTITATIVE SENSORY TESTING – MOVING FROM STATIC TO DYNAMIC TESTING PARADIGMS TO EVALUATE ENDOGENOUS PAIN MODULATION

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MPA2A, Meeting Room C4.5, October 19, 2017, 11:25 AM - 12:10 PM

#### Background:

Impairment of endogenous pain modulation is associated with many chronic pain disorders and may explain non-response to manual and exercise therapy. Dynamic testing paradigms associated with these central processes are believed to better depict the clinical pain experience, compared to classical static parameters, such as pain thresholds. Conditioned pain modulation (CPM) is utilized to test inhibitory processes and spatial parameters associated with pain, whilst temporal summation (TS) evaluates facilitatory processes and temporal filtering of noxious input. Exercise-induced hypoalgesia (EIH) evaluates pain sensitivity following exercise. Response to these experimental paradigms can evaluate referred and latent pain; predict future pain (e.g. post-surgery); predict efficacy of analgesics and determine exercise suitability.

#### Aims/Objectives:

Participants will gain theoretical knowledge and skills within a clinical reasoning framework to effectively evaluate paradigms that assess an individual's pain modulation profile, involving competency in application of CPM, TS and EIH. Participants will be able to utilize these paradigms to both evaluate and to direct/monitor treatment.

#### Approach:

Background knowledge will be provided via a lecture style format (10 mins). Demonstrations of the paradigms (10 mins) will be complemented with videos, and individuals will have the chance to practice one of the tests (10 mins). Participants will be provided with electronic resources to facilitate knowledge translation.

#### Conclusion / Key Practice Points:

- Participants will understand the importance and limitations of evaluation of an individuals' pain modulation profile
- Participants will be able to integrate these testing paradigms into their clinical practice.
- Utilisation of these testing paradigms will inform clinical management of patients.

## NON-INVASIVE BRAIN STIMULATION TO ENHANCE TRADITIONAL THERAPY IN MUSCULOSKELETAL PAIN

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MPA2A, Meeting Room C4.5, October 19, 2017, 11:25 AM - 12:10 PM

In recent years there has been an explosion of interest in technologies that can alter neuroplasticity in the human brain. These techniques have theoretical uses that range from improved learning in the healthy brain, maintenance of cognitive and motor function into old age and the treatment of pathologies such as depression, stroke and chronic pain. This presentation will explore the evidence for these techniques (including non-invasive brain and peripheral stimulation) as tools to improve pain and function in chronic musculoskeletal disorders. In particular, this presentation will examine the use of non-invasive stimulation to temporarily modify – or ‘prime’ – cortical networks to create a therapeutic window of enhanced neuroplasticity that can be exploited using traditional therapy. This approach has the potential to enhance the brain’s responsiveness to traditional therapy such as exercise, manual therapy or pharmacotherapy, improving pain and function beyond that which can be achieved with traditional therapy alone. Examples of priming applications in pain, including treatment parameters, will be detailed. The presentation will conclude with a discussion of the limitations and controversies in this field including strategies for the selection of individuals most likely to respond to this form of treatment.

### Key Practice Points:

- Understand the role of non-invasive brain and peripheral stimulation in creating a therapeutic window of enhanced neuroplasticity
- Understand how this critical therapeutic window can be exploited using traditional treatments
- Understand how and when non-invasive stimulation should be combined with traditional therapy for the treatment of musculoskeletal pain
- Understand the current state of this emerging field – including limitations and methods to identify responders vs. non-responders.

## DOES A GREATER NUMBER OF CURVES IN THE VERTEBRAL ARTERY RELATE TO REDUCED BLOOD FLOW VOLUME?

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MPA2B, Meeting Room C4.1, October 19, 2017, 11:25 AM - 12:10 PM

### Aim:

To evaluate normal variations in tortuosity of vertebral artery in healthy adults and effects on blood flow volume. Arterial tortuosity is a marker for vascular fragility and has been linked to dissection.

### Design:

Observational, cross-sectional case series.

### Method:

Fifteen healthy participants, mean age 34 years, underwent magnetic resonance angiography (MRA) in neutral head position. Cervical arterial flow volume (C1 to the atlas loop) was measured with phase-contrast flow quantification. Blood flow was analysed post-hoc and volume-rendered 3D reconstructions of flow volume created. Vertebral artery course was explored and compared with flow volume.

### Results:

Thirty vertebral arteries were examined for tortuosity ie. kinks (Z-shaped angulation) or coils (S-shaped/circular configuration). Arteries were categorized into 1-3 or 4-6 kinks. The majority (56.7%) had 4 kinks in the atlanto-axial region, 8 (26.7%) were relatively straight with 2 kinks, 5 arteries (16.7%) had 5-6 kinks. Coils were generally not present in those with fewer kinks. In arteries with 4 or more kinks, 12 contained noticeable coils. Mean flow volume in arteries with 4-6 kinks was 1.02mL/s, and was 0.80mL/s in

those with 1-3 kinks. No significant correlation was found between number of kinks and flow volume ( $p = 0.19$ ).

**Conclusion/Key Practice Points:**

- Variations in tortuosity occur in healthy individuals and appear not to influence blood flow volume in neutral.
- Increased tortuosity may increase stress on arteries in head rotation, potentially impacting flow volume, and may increase risk with cervical manual therapy.
- Future studies will investigate effects of head rotation on tortuous and non-tortuous vessels.

## INFLUENCE OF NECK TORSION ON NEAR POINT CONVERGENCE IN SUBJECTS WITH IDIOPATHIC NECK PAIN

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MPA2B, Meeting Room C4.1, October 19, 2017, 11:25 AM - 12:10 PM

**Objectives:**

People with neck pain (NP) experience sensorimotor and oculomotor deficits thought to be due to abnormal cervical afferent input. Convergence insufficiency (CI) measured by near point convergence (NPC) may be impaired in NP and neck torsion might help to differentiate a cervical cause. This study aimed to investigate repeatability and reliability of NPC in neutral and torsion and compare between idiopathic NP and controls along with correlation to the Convergence Insufficiency Symptom Survey (CISS).

**Design:**

Comparative cross sectional observational study.

**Method:**

A Royal Airforce (RAF) Rule measured NPC with the neck in neutral and in 45 degrees torsion to the left and right in 42 subjects. A revised 15 item CISS was also completed. The average of 3 trials in each position and torsion difference were calculated. Within one week, NPC inter-rater and test-retest reliability was evaluated in 10 subjects.

**Results:**

A significant NPC torsion difference was demonstrated in participants with NP compared to controls ( $P=0.01$ ). No significant differences were seen for NPC values in neutral ( $P=0.73$ ). High inter-rater reliability ( $ICC=0.95$ ) and repeatability ( $ICC=0.84$ ) was obtained. No correlations were present between the CISS and NPC measures ( $r \leq 0.18$ ).

**Conclusions:**

NPC is impaired in neck torsion compared to neutral in NP suggesting a cervical afferent cause. NPC, measured using the RAF Rule, is a reliable and repeatable measure and can be used to assess NPC and CI in those with NP. Objective rather than self-reported measures should be used to examine CI in NP.

## INVESTIGATING CERVICAL ARTERIAL WALL STIFFNESS AND THE EFFECT OF HEAD ROTATION WITH SHEAR WAVE ELASTOGRAPHY

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MPA2B, Meeting Room C4.1, October 19, 2017, 11:25 AM - 12:10 PM

**Aim:**

To investigate the mechanical properties of cervical arteries in neutral and contralateral head rotation using shear wave elastography

**Design:**

Observational study

#### Method:

The internal carotid and vertebral arteries of healthy participants were imaged with B-mode, Doppler, and shear wave elastography with an Acuson Siemens S3000 ultrasound system using a 9 MHz linear transducer. Measurements of arterial wall thickness (mm), blood flow velocities (cms-1), and wall stiffness (cms-1) were taken proximally at C3-4 and distally at C1-2, in the neutral head position and at end range contralateral rotation. Repeatability of stiffness measures was assessed. Linear regression analysis was used to compare wall stiffness between arteries and the neutral and contralateral head rotation positions.

#### Results:

Thirty participants (16 male) mean age 29.8 years (SD12.8, range 20-62) entered the study. Good inter-rater reliability of the elastography technique was achieved (ICC ICA 0.71, VA 0.61). The vertebral arterial wall was stiffer (3.45 cm/s) than internal carotid (2.45cm/s) in neutral ( $p < 0.001$ ), and stiffness increased in contralateral rotation ( $p = 0.043$ ). Internal carotid wall became less stiff in contralateral rotation ( $p = 0.038$ ). As vertebral arterial wall thickness increased, stiffness decreased ( $p = 0.027$ ). There was no correlation between wall stiffness and flow velocities.

#### Conclusion/Key Practice Points:

- Ultrasound elastography can reliably determine cervical arterial wall stiffness and identify changes with head position. Increased stiffness has been proposed as a risk for cervical arterial dissection.
- Future studies will investigate clinical populations with dissection.
- Elastography may have potential application in risk assessment prior to cervical manual therapy.

### MUSCULOSKELETAL PHYSIOTHERAPIST'S RECOMMENDATIONS FOR THE REVISION OF APA (2006) VBI GUIDELINES: REPORT FROM FOCUS GROUPS

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MPA2B, Meeting Room C4.1, October 19, 2017, 11:25 AM - 12:10 PM

#### Aim:

To investigate experiences and viewpoints of physiotherapists on the clinical utility and currency of the APA 2006 Clinical Guidelines for Assessing Vertebrobasilar Insufficiency in the management of Cervical Spine Disorders and report recommendations for revision.

#### Design:

Qualitative research design using Focus Groups.

#### Method:

Focus groups were conducted in five Australian states by an independent qualitative researcher and a subject expert. Qualitative data were collected from 41 APA/MPA members purposefully selected for their broad range of experience and qualifications. Data were analysed using the five stage Framework Analysis approach.

#### Results:

Four main themes emerged around current influences on practice, familiarity and use of the Guidelines, and recommendations for revision. A new title and broader risk assessment and management approach was proposed, encompassing musculoskeletal and relevant cardio-vascular risks. Guidelines should include a positively worded stepwise guide to clinical reasoning, indicating: (i) when it is safe to proceed with treatment; (ii) when to make a medical referral; and (iii) when to wait and/or do additional testing. Revision should outline current requirements for informed consent, and be available in a wide range of formats to reach clinicians with varying learning styles and experience.

#### Conclusion/Key Practice Points:

- Advice to physiotherapist's at all clinical levels should accurately reflect risks and benefits of manual therapy and provide clear evidence-based approach to safe practice in the cervical spine. Revision should include:
- Broader scope reflected in the title
- Research evidence and clinical experience should inform risk assessment
- Clear guidance on requirements for informed consent
- Accessibility in multiple formats.

#### IS SEVERITY OF LATERAL EPICONDYLALGIA ASSOCIATED WITH DIFFERENCES IN SOMATOSENSORY PROFILES: A CROSS-SECTIONAL STUDY

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MPA2C, Meeting Room C4.10, October 19, 2017, 11:25 AM - 12:10 PM

#### Aim:

To investigate differences in somatosensory profiles between subgroups of patients with lateral epicondylalgia with severe and less severe pain and disability, and healthy controls.

#### Design:

Cross-sectional study.

#### Method:

102 patients (mean age 48 years, 60% male) with a clinical diagnosis of lateral epicondylalgia were sub-grouped into severe (n=17) and less severe (n=85) on the basis of the Patient Rated Tennis Elbow Evaluation (cut-off score: 51/100). 33 healthy controls (mean age 49 years, 58% male) were also recruited. Self-reported measures included the PainDETECT to evaluate neuropathic-like symptoms, and the Nordic Musculoskeletal Questionnaire to identify co-existing pain sites. Quantitative sensory testing comprised thermal and mechanical detection and pain thresholds, vibration threshold, pain sensitivity to sharp and blunt mechanical stimuli, temporal summation of heat pain and conditioned pain modulation.

#### Results:

The severe subgroup of lateral epicondylalgia reported higher PainDETECT scores ( $p < 0.001$ ) and higher number of other pain sites ( $p = 0.01$ ) than the less severe subgroup. The severe subgroup were more sensitive to noxious cold stimuli with pain threshold at higher temperatures at the elbow and tibialis anterior than controls (mean difference (95%CI), elbow:  $6.2^{\circ}\text{C}$  (0.3 to 12.1),  $p = 0.04$ ; tibialis anterior:  $5.4^{\circ}\text{C}$  (1.7 to 9.2),  $p = 0.002$ ). Cold pain was induced at higher temperatures at tibialis anterior in the severe than less severe subgroup ( $4.68^{\circ}\text{C}$  (1.36 to 8.0),  $p = 0.003$ ).

#### Conclusion/Key Practice Points:

- Severe lateral epicondylalgia is differentiated from low severity by widespread cold hyperalgesia.
- Number of co-existing pain sites is associated with severity.

#### THREE-DIMENSIONAL DEFORMATION OF THE TENDINOPATHIC ACHILLES TENDON DURING REPEATED LOADING

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MPA2C, Meeting Room C4.10, October 19, 2017, 11:25 AM - 12:10 PM

#### Aim:

Mid-portion Achilles tendinopathy (MAT) alters the normal three-dimensional (3D) morphology of the Achilles tendon (AT) at rest and under a single tensile load. During repeated loading, tendon experiences gradual 3D deformation until steady-state behavior is reached. How this tendon time-dependent viscoelastic behavior is

altered in MAT remains unclear. This study compared the AT longitudinal, transverse, and volume strains during repeated loading in MAT with those of the contralateral tendon in people with unilateral MAT.

Design:  
Cross-sectional study

Method:  
Ten adults with unilateral MAT performed 10 successive 25 second submaximal (50%) voluntary isometric plantarflexion contractions with both legs. Freehand 3D ultrasound scans were recorded and used to measure whole AT, free AT, and aponeurosis longitudinal strains and free AT cross-sectional area (CSA) and volume strains.

Results:  
The whole and free AT experienced higher longitudinal and free AT CSA strain and reached steady state following a greater number of contractions (5 contractions) in MAT compared to the contralateral tendon (3 contractions). Further, free tendon CSA and volume strained more in MAT than contralateral tendon from the first contraction, whereas whole and free AT longitudinal strain were not greater than the contralateral tendon until the fourth contraction. Volume loss from the tendon core therefore preceded the greater longitudinal creep in MAT.

Conclusion/Key Practice Points:

- Overall, these findings suggest that the aberrant strain behaviour under repeated loading in MAT is underpinned by altered solid and fluid behaviour.
- This finding may have implications for tendon function, injury risk and repair mechanisms in MAT.

#### MALES WITH UNILATERAL ACHILLES TENDINOPATHY HAVE IMPAIRED BALANCE ON THE SYMPTOMATIC SIDE

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MPA2C, Meeting Room C4.10, October 19, 2017, 11:25 AM - 12:10 PM

Objectives:  
To investigate single leg standing balance in males with mid-portion Achilles tendinopathy.

Design:  
Within subjects repeated measures design.

Method:  
Centre of pressure (COP) path length was measured using a Wii Balance Board (WBB) in 21 male participants (20-60 years) with unilateral mid-portion Achilles tendinopathy during single-limb standing on each limb with eyes open and closed. Ultrasound imaging of both Achilles tendons was also performed by one blinded assessor, and the anteroposterior (AP) thickness and presence of pathology was determined. Comparisons were made between symptomatic and asymptomatic sides for key outcomes, and correlation between COP path length and variables of interest was investigated.

Results:  
Symptomatic Achilles tendons demonstrated significantly increased AP tendon thickness ( $p < 0.001$ ). Participants with Achilles tendinopathy demonstrated increased COP path length (sway amplitude) on their affected side during the eyes closed task ( $p = 0.001$ ). Increased tendon thickness was associated with increase sway amplitude during the eyes open task ( $\rho = 0.37$ ,  $p = 0.016$ ).

#### Conclusions:

In males with Achilles tendinopathy, single-leg standing balance with eyes closed is impaired on the symptomatic side. This indicates that neuromuscular deficits affecting functional ability may be present in people with Achilles tendinopathy during more challenging balance activities. It is unclear if this deficit precedes the onset of symptoms, or is a consequence of tendon pain. Clinicians should consider interventions to address single leg standing balance among people with Achilles tendinopathy.

#### A SYSTEMATIC REVIEW OF CLINICAL IMPAIRMENTS, PAIN AND DISABILITY IN POSTERIOR TIBIAL TENDON DYSFUNCTION

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<sup>1</sup>The University of Queensland, St Lucia, Australia

MPA2C, Meeting Room C4.10, October 19, 2017, 11:25 AM - 12:10 PM

#### Aim:

To quantify reported clinical impairments, pain and disability in individuals with PTTD compared with controls and to determine the relative magnitude of deficits in muscle function, foot posture and motion, pain and disability.

#### Design:

A systematic review of observational studies with calculation of standardised mean differences and meta-analysis where possible.

#### Method:

Five databases were searched for terms referring to the posterior tibial tendon and flatfoot up to and including 13 June 2016. Studies were included if measures of clinical impairment, pain or disability were evaluated in individuals with PTTD or acquired flatfoot due to PTTD compared to controls.

#### Results:

Ten studies were included and meta-analysis was performed on five clinical impairments and three subscales of the self-report Foot Function Index. Meta-analysis revealed strong effects for poor heel rise endurance (SMD -1.52, 95% CI -2.05 to 0.99) and lower arch height (SMD -1.76, 95% CI -2.29 to -1.23) as well as more self-reported stiffness (SMD 1.45, 95% CI 0.91 to 1.99), difficulties caused by foot problems (SMD 1.42, 95% CI 0.52 to 2.33) and social restrictions (SMD 1.26, 95% CI 0.25 to 2.27). Large effects were also found from individual studies for lower heel-raise height (SMD -1.99 (-2.82 to -1.15)) and greater pain following activity (SMD 1.25, 95% CI 0.51 to 1.99).

#### Conclusion/Key Practice Points:

- PTTD is characterised by impairments related to local tendon dysfunction and foot posture which manifest as self-reported pain and functional limitations
- Knowledge of specific clinical factors influencing function may further direct assessment and management of PTTD.

#### CEREBROVASCULAR RESERVE CAPACITY: A POTENTIAL BIOMARKER FOR BRAIN HEALTH

**Billinger S<sup>1</sup>**, Sisante J<sup>1</sup>, Vidon E<sup>2</sup>, Kirkendol K<sup>1</sup>, Ward J<sup>1</sup>, Liu Y<sup>1</sup>, Burns J<sup>2</sup>

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NNG2, Meeting Room C4.8, October 19, 2017, 11:25 AM - 12:10 PM

#### Aim:

The primary objective was to examine cerebrovascular regulation in a well-characterized cohort of cognitively normal older adults. The major hypothesis tested was that the presence of beta amyloid would result in a lower cerebrovascular reserve capacity (CVRC) independent of mean arterial pressure (MAP) change.

#### Design:

Quasi-experimental

#### Method:

Participants were recruited through the KU Alzheimer's Disease Center's Alzheimer's Prevention Program. The presence of beta-amyloid was characterized with florbetapir positive emission tomography (PET) scans. Middle cerebral artery blood flow velocity was measured with transcranial Doppler ultrasound during an 8-minute period at rest and during an 8-minute moderate intensity exercise bout. Study team was blinded to amyloid status. We calculated the CVRC as the difference in blood flow velocity from rest to exercise. A finger plethysmograph was placed on the middle finger of the left hand and collected continuous beat-to-beat measures for MAP.

#### Results:

We found that individuals with elevated beta-amyloid had a blunted CVRC ( $n = 25$ :  $3.3 \pm 3.7$  cm/s) than non-elevated individuals ( $n = 45$ :  $7.2 \pm 5.0$  cm/s,  $p < 0.001$ ). Further, greater beta-amyloid load was linearly associated with less CVRC across all participants ( $b = -11.4$ ,  $p = 0.0002$ ). No significant differences were observed between groups for MAP ( $p > 0.10$ ).

#### Conclusion/Key Practice Points:

- These results extend the growing literature in humans that cerebrovascular dysfunction and beta-amyloid accumulation are closely linked.
- CVRC may be an important early marker of Alzheimer's disease pathology and biomarker for brain health.

### PHYSICAL ACTIVITY OF CHILDREN WITH HERITABLE DISORDERS OF CONNECTIVE TISSUE: A COMPARATIVE STUDY

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NPG2A, Meeting Room C4.9, October 19, 2017, 11:25 AM - 12:10 PM

#### Aims:

To investigate the physical activity participation of children with hypermobile Ehlers-Danlos Syndrome and Osteogenesis Imperfecta.

#### Design:

Cross-sectional study

#### Methods:

Fifty-five school-aged children with Osteogenesis Imperfecta and 34 children with hypermobile Ehlers-Danlos Syndrome were recruited from a tertiary clinic. Physical activity was assessed using the Adolescent Physical Activity Recall Questionnaire. Current presenting complaints were collected via interview.

#### Results:

Participants had a mean age of 12.5 years. Forty-seven percent of children undertook the recommended 60 minutes or more of moderate to vigorous physical activity per day. There was no significant difference in the minutes per week of moderate to vigorous physical activity between children with either condition (mean difference 29 minutes, 95% CI -134 to 191 minutes). Children with Osteogenesis Imperfecta spent a significantly greater percentage of their physical activity time undertaking non-organised activity in comparison to children with hypermobile Ehlers-Danlos Syndrome (mean difference 19.4%, 95% CI 4.1 to 34.9%). Girls with Osteogenesis Imperfecta spent significantly less minutes per week being active compared to boys (mean difference 248 minutes, 95% CI 54 to 442 minutes). There was no gender difference in participation of children with hypermobile Ehlers-Danlos Syndrome. The most common physical activities were swimming and walking in both groups (> 40% participation).

#### Conclusion/Key Practice Points:

- Over half of children with heritable disorders of connective tissue don't meet daily physical activity recommendations.
- When participating, most children undertake low impact activities.
- Girls with Osteogenesis Imperfecta are the least active group and may benefit from intervention tailored specifically to their needs.

#### BARRIERS TO PHYSICAL ACTIVITY IN CHILDREN WITH BURNS: A CROSS SECTIONAL DESIGN OF CHILD AND CAREGIVER PERSPECTIVES

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NPG2A, Meeting Room C4.9, October 19, 2017, 11:25 AM - 12:10 PM

#### Aims:

To investigate barriers to physical activity of children and adolescents three to six months post burn injury, as perceived by the child and their caregiver. Secondary aims include comparing child and caregiver responses, and determining if a relationship exists between reported barriers and physical activity levels.

#### Design:

Cross-sectional

#### Method:

Children with burn injuries and their caregiver participated in the study. Participant characteristics were recorded. Each child and caregiver completed an online questionnaire regarding barriers to physical activity. Child and caregiver scores were compared. Physical activity levels were determined using the Physical Activity Questionnaire for children (PAQ-C) and adolescence (PAQ-A).

#### Results:

Fifteen participants aged seven to 15 years, with a mean total burn surface area of 9% (SD 11.24%) participated. Ninety-three percent of children and caregivers perceived one or more barriers to physical activity, with internal barriers more frequent than external. Fatigue (73%), fear of hurting themselves (53%) and fear of adverse scar damage (47%) were the most frequent child-reported internal barriers. Agreement between child and caregiver reported external barriers (75.15%) was greater than agreement between internal barriers (63.88%). A large negative correlation was found between number of child-reported barriers and physical activity levels ( $r = -0.70$ ,  $p = 0.003$ ) suggesting the greater number of perceived barriers to physical activity reported, the less physical activity undertaken.

#### Conclusions:

Children living with burns report several barriers to physical activity, some of which are specific to their burn injury. Clinicians should consider these barriers when tailoring interventions to improve physical activity levels.

#### PHYSICAL ACTIVITY AND FUNCTIONAL AMBULATION IN CHILDREN AND ADOLESCENTS WITH CHARCOT-MARIE-TOOTH DISEASE IS REDUCED COMPARED TO THEIR TYPICALLY DEVELOPING PEERS

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NPG2A, Meeting Room C4.9, October 19, 2017, 11:25 AM - 12:10 PM

#### Aim:

To investigate physical activity and functional ambulation in paediatric Charcot-Marie-Tooth disease (CMT).

#### Design:

Cross-sectional case-controlled study of children with CMT and age- and gender- matched typically developing (TD) children.

#### Method:

Children 4-18 years with a genetic or clinical diagnosis of CMT from The Royal Children's Hospital (Melbourne) and The Children's Hospital (Westmead) and a reference group of TD children were recruited. Assessments included: a 7-day recall physical activity questionnaire (PAQ); a test of functional ambulatory capacity (six-minute walk test (6MWT)); and classification of walking ability (Functional Mobility Scale). Group differences for PAQ were analysed with Wilcoxon sign-ranked test; and paired t-tests for all other comparisons.

#### Results:

Forty-four children with CMT and 44 TD children were assessed (mean age 13 years, SD 4; 21 female). Children with CMT had significantly lower activity levels (PAQ scores: CMT median 2.18, IQR 1.43 to 2.83, TD median 2.80, IQR 2.16 to 3.26;  $p < 0.001$ ). A subset of 27 children with CMT and matched TD children completed a 6MWT in footwear. The distance walked by children with CMT was significantly less (CMT mean 484 metres, SD 174, TD mean 646 metres, SD 76;  $p < 0.001$ ). Half the children with CMT indicated difficulty walking at home, school and / or community environments.

#### Conclusion:

- Children with CMT are significantly less physically active than TD children and exhibit reduced functional ambulatory capacity including difficulty walking in different environments.
- Future research is required to investigate effects of increased physical activity on functional ambulatory capacity.

#### HOW TO: TACTILE ASSESSMENT IN CHILDREN WITH CEREBRAL PALSY

**Auld M<sup>1,2</sup>**, Johnston L<sup>1</sup>

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NPG2B, Meeting Room C4.3, October 19, 2017, 11:25 AM - 12:10 PM

#### Background:

Tactile impairments are present in over 77% of children with unilateral cerebral palsy, and over 40% of these children are unable to even detect touch information (Auld et al 2012). These deficits have a significant impact on upper limb motor performance. Despite this, tactile assessment is not a routine part of paediatric clinical practice, with therapists reporting a lack of knowledge, skills and confidence in carrying out tactile assessments in this population (Auld and Johnston, 2016). Using a systematic framework, tactile assessments can be divided into two domains: tactile registration (i.e. detection) and tactile perception (i.e. understanding touch information).

#### Aims/ objectives:

To provide paediatric physiotherapists with the knowledge and skills to carry out tactile assessments in children with cerebral palsy. Participants will understand the tactile assessment framework and be able to appropriately select, implement and interpret tactile registration and perception assessments.

#### Approach:

Presenters will review the recent literature on tactile assessment in children (10 minutes) and demonstrate the brief "Touch in 10" assessment consisting of tactile assessments most strongly related to motor performance in children (10 minutes). Participants will then have the opportunity to practise and receive feedback on their performance of these assessment items (20 minutes). A 'how to' manual and some relevant equipment will be provided to participants.

#### Conclusions/ Key Practice Points:

- Participants will understand the importance of tactile assessment and the theory behind the tactile assessment framework.
- Participants will be able to implement the "TOUCH in 10" assessment in clinical practice with confidence.

## INTERACTION OF MENTAL AND PHYSICAL FACTORS IN WORKPLACE HEALTH

**McAtamney L<sup>1</sup>**

<sup>1</sup>ATUNE Health Centres, Lake Macquarie, Australia

OHP2, Meeting Room C3.3, October 19, 2017, 11:25 AM - 12:10 PM

### Outline:

Occupational Physiotherapists and Ergonomists are in many ways detectives, applying scientific assessment tools to complex human interactions within the person's work environment to reveal the causes and solutions to problems. Assessment tools such as the Rapid Upper Limb Assessment (RULA) were developed to enable risk assessments of the posture, force and movements occurring. However, we need to be increasingly mindful of the contribution made by non-physical factors including cognitive, psychosocial and environmental influences in the reporting of work related musculo-skeletal symptoms. This presentation reflects on research findings about the interactions of cognitive, psychosocial factors and environmental factors in the contribution to musculoskeletal disorders and how we apply them as occupational physiotherapists in early intervention and education programs.

### Key Practice Points:

- Insight into research on the interaction of risk factors and their contribution to work related musculoskeletal disorders
- Understanding of the impact of environmental factors on the wellbeing of the working population
- The usefulness of resilience (Thrive) programs to bridge understanding of the whole of person response to life and work styles that are protect their body's capacity, wealth and health.

## LONGER TIME IN NEUTRAL HEAD AND THORACIC POSTURES DURING WORK PREVENTS NEW EPISODE OF INTERFERING NECK PAIN IN OFFICE WORKERS

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OHP2, Meeting Room C3.3, October 19, 2017, 11:25 AM - 12:10 PM

### Aim:

To evaluate the prevention effect of neutral head/thoracic posture during work for the development of neck pain in office workers.

### Design:

A one year prospective study conducted in two distinct cultures.

### Method:

At baseline, asymptomatic office workers from Brisbane, Australia (n= 156), and Daegu, Korea (n= 58) participated in a 60 minute posture assessment using 3-D motion sensors located on the head, thoracic spine, and upper arm while performing usual work. The outcome, a new episode of interfering neck pain (defined as limitation of daily activity or medical treatment) was reported via an online monthly questionnaire for one year. Analyses were adjusted for potential covariates: cervical muscle strength/endurance, upper limb range of motion, job strain (Job Content Questionnaire), coping strategies at work (Coping with Job Stress Scale), and ergonomic factors.

### Results:

Workers who maintained their thoracic and head in neutral postures (between 10° extension and 10° flexion thoracic posture, and between 5° extension and 10° flexion head posture) for 10% longer were 5.1 times less likely to develop a new episode of neck pain during the following 12 months (Hazard Ratio = 0.20, 95%CI 0.07 – 0.52). However, the prevention effect of neutral posture was not significant when cervical flexor muscles had poor endurance (interaction effect).

Conclusions:

- Adopting a neutral posture of the head and thorax may prevent the development of neck pain
- Greater endurance of cervical flexor muscles may contribute to the prevention effect of neutral posture on the development of neck pain.

## MULTIDISCIPLINARY TREATMENT WITH ECMO IN CYSTIC FIBROSIS – A SINGLE CENTRE EXPERIENCE

**Dentice R<sup>1</sup>**, Sivam S<sup>1</sup>, Reddy N<sup>1</sup>, Moriarty C<sup>1</sup>, Yozghatlian V<sup>1</sup>, Mellis C<sup>1</sup>, Glanville A<sup>2</sup>, Torzillo P<sup>1</sup>, Gattas D<sup>1</sup>, Bye P<sup>1</sup>

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R5-2, Meeting Room C4.2, October 19, 2017, 11:25 AM - 12:10 PM

Aim:

Extracorporeal Membrane Oxygenation (ECMO) support is used in selected patients with Cystic Fibrosis (CF) as a bridge to transplant. Our aim was to briefly describe treatment and outcomes of six patients with CF who received ECMO.

Design:

Retrospective audit at Royal Prince Alfred Hospital.

Methods:

All ICU, respiratory and physiotherapy entries, procedural notes and medication charts during their ICU admission were reviewed.

Results:

Six CF patients were placed on ECMO support between 2009 and 2016. Indications for ECMO varied between bridge to transplant and acute respiratory failure. One patient had awake ECMO and 2 patients survived their ECMO run, one of whom received a lung transplant. Three of six patients received chest physiotherapy within 48 hours of ECMO initiation. Chest physiotherapy and medications for airway clearance were not initiated within 48 hours in those with pneumothoraces and massive haemoptysis. Bronchoscopy for airway clearance and high frequency chest wall oscillation were rarely performed. Physical rehabilitation was safely performed on 2 of 6 patients during ECMO. Three patients received heavy sedation and paralysis for more than 48 hours after ECMO initiation. Two sites of ECMO cannulation were utilised in 4 patients. One patient received a tracheostomy.

Conclusion/Key Practice Points:

- Four of six patients in our series died secondary to the severity of their lung disease, lack of timely availability of donor lungs, sepsis and ECMO related complications.
- Variation in multidisciplinary (including physiotherapy) practice for each patient is reflective of the need for individualised treatment while on ECMO.

## SENSORIMOTOR AND PHYSIOLOGICAL INDICATORS OF IMPAIRMENT FOLLOWING MILD TRAUMATIC BRAIN INJURY: A META-ANALYSIS

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R5-2, Meeting Room C4.2, October 19, 2017, 11:25 AM - 12:10 PM

Background and aims:

In adults, resolution of neurocognitive deficits and symptoms following Mild Traumatic Brain Injury (MTBI), otherwise known as Concussion, has been reported to occur within 7-10 days post injury. However, there is some evidence that sensorimotor and physiological changes may persist even in the subacute period (28 days to 6 months). The aim of this study was to provide a synthesis of the best available evidence examining the persistence of sensorimotor and physiological changes in subacute MTBI.

#### Method:

Databases; Pubmed, psycINFO, SPORTdiscus, Medline, CINAHL and Embase were searched between March and November 2016. a priori inclusion criteria was used to identify eligible studies. Critical appraisal was performed and an evidence matrix used to establish level of evidence. Where possible data was pooled to determine Standard Mean Difference (SMD) and 95% confidence intervals.

#### Results:

Nineteen eligible articles achieved a mean quality score of 14.53 of a possible 22 points (SD=2.07). Meta-analysis of Centre of Motion variable; maximal mediolateral (ML) displacement Standard Mean Difference approached significance (SMD (95%CI) -0.42 [-0.84, -0.00] p= 0.05) for the level walking dual task condition, indicating a potential reduction in mediolateral excursion during gait in the MTBI group. Additionally, significant differences in a further 16 sensorimotor and physiological variables (e.g. balance, gait velocity and motion analysis outcomes, various oculomotor tasks, as well as heart rate variability frequency-domain measures) were demonstrated.

#### Conclusion:

Moderate to strong level of evidence supports the persistence of sensorimotor and physiological changes in subacute MTBI. This has ramifications for long-term management.

### ALLIED HEALTH CLINICAL EDUCATOR PERCEPTIONS OF THE IMPACT OF DISABILITY PLACEMENT ON STUDENTS' ATTITUDES TOWARDS WORKING WITH PEOPLE WITH DISABILITY

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R5-2, Meeting Room C4.2, October 19, 2017, 11:25 AM - 12:10 PM

#### Aim:

To explore allied health educator perceptions of the impact of disability placement on allied health students' attitudes towards working with people with disability.

#### Design:

Qualitative research design.

#### Method:

Allied health clinical educators (physiotherapists, occupational therapists and speech pathologists) from three disability organisations were invited to attend focus groups to explore their perceptions of student's attitudes towards people with disability and how well prepared students were for disability placements and employment. Thematic analysis of the focus group data was conducted.

#### Results:

Clinical placement related factors that influenced willingness, readiness and preparedness of allied health students to work with people with disability included providing learning materials prior to placement; influencing students' preconceived and un-reflected attitudes towards disability; scaffolding students' involvement with clients; and modelling passion and commitment to supporting people with disability. Factors relevant to the university setting included preparation of the students for placement, exposure to the disability discourse and collaborative partnership between universities and clinical educators.

#### Key Practice Points:

Allied health students may be more willing and prepared to work with people with disability if:

- They are provided learning materials prior to disability placements.
- They are supported to reflect on their attitudes towards people with disability.
- Their involvement with people with disability is scaffolded.
- They see passion and commitment in their clinical educator.
- Their university prepares them for their disability placement and exposes them to discussion about disability.
- There is a strong collaborative partnership between their university and clinical educator.

## CORRELATION BETWEEN SHOULDER WEAKNESS WITH GRIP STRENGTH, SELF-REPORTED PAIN AND FUNCTION IN PATIENTS WITH LATERAL EPICONDYALGIA- A PILOT STUDY

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R5-2, Meeting Room C4.2, October 19, 2017, 11:25 AM - 12:10 PM

### Aims:

Investigate incidence of shoulder weakness and its correlation with grip strength, self-reported pain and function, in an Asian population of patients with Lateral Epicondylalgia.

### Design:

Retrospective convenient sample study.

### Methods:

19 subjects (53.4± 8.8 years old) diagnosed with unilateral lateral epicondylalgia were tested for isometric strength of bilateral middle trapezius, lower trapezius, serratus anterior, shoulder external and internal rotation and grip. Function was scored using Quick-Disability of Arm, Shoulder and Hand Questionnaire. Shoulder weakness between arms was compared using paired t-test. Correlation of shoulder weakness with grip strength, pain and function was tested using bivariate correlation analysis.

### Results:

All shoulder muscles were weaker on the affected arm, with strength ratio of the affected to unaffected arm <1.0. Affected arms had significantly reduced grip strength with ratio 0.74±0.21, p=0.00. Strength on affected arms was most reduced in the lower trapezius (0.90± 0.2), p=0.016, but this did not have significant correlation to self-reported pain or function. Self-reported pain had positive, moderate correlation with functional impairment (r=0.47, p=0.04) and limitations with work-related activities (r=0.49, p=0.03).

### Conclusion:

In this Asian population, scapulothoracic and rotator cuff muscles were noted to be weaker on Lateral Epicondylalgia-affected arms, with marked lower trapezius weakness. However, the correlation between shoulder weakness, self-reported pain and function is insignificant. "Isometric" strength, may not be reflective of patients' pain and function. Future studies involving different treatment protocols for may better investigate the relationship between physical assessment parameters and patient-rated outcomes, and contribute to more efficacious rehabilitation.

## THE FIVE TIMES SIT-TO-STAND TEST: FEASIBILITY, INTRARATER AND INTERRATER RELIABILITY IN HOSPITALIZED PATIENTS

**Melo T<sup>1,6</sup>**, Duarte A<sup>2</sup>, Bezerra T<sup>3</sup>, França F<sup>4</sup>, Brito D<sup>5</sup>

<sup>1</sup>Universidade Salvador (UNIFACS), Salvador, Brazil, <sup>2</sup>Instituto Sócrates Guanaes , Rio de Janeiro , Brazil ,

<sup>3</sup>Hospital Teresa de Lisieux, Salvador , Brazil , <sup>4</sup>Hospital Teresa de Lisieux , Salvador, Brazil, <sup>5</sup>University

Centre Estácio FIB, Salvador, Brazil , <sup>6</sup>Hospital Aliança, Salvador, Brazil

R5-2, Meeting Room C4.2, October 19, 2017, 11:25 AM - 12:10 PM

### Aim:

To investigate safety and reliability of the five times sit-to-stand test (FTSST) in hospitalized patients. Sit-to-stand performance is associated with muscle strength, balance control and risk of falls. However, its feasibility concerning a hospital setting has not been investigated yet.

### Design:

Cross-sectional study, held between July and December 2015 at Teresa Lisieux Hospital, Salvador, Brazil.

### Method:

96 patients (age ≥ 18 years) from a general intensive care unit were assessed at the time of discharge. The test was repeated 3 times, and the average taken for further analysis.

Hemodynamic and respiratory variables were measured at the beginning and at the end of the test, and the frequency of adverse events were recorded. Patient performance was compared across demographic variables.

**Results:**

Paired t-test presented no significant difference between trials ( $p=0.83$ ). Excellent intrarater ( $ICC=0.99$ ) and interrater reliability ( $ICC=0.99$ ) were shown. Bland-Altman plot showed no evidence of bias across trials and survival agreement plot revealed a considerable degree of agreement between the examiners. Heart rate ( $p=0.001$ ) and systolic blood pressure ( $p=0.03$ ) presented a statistically significant difference, however, without clinical significance. Age, gender, length of stay, admitting diagnosis and use of mechanical ventilation seem to be linked with poorer performance.

**Conclusion / Key Practice Points:**

- The FTSST presented high interrater and intrarater reliability and was considered to be a feasible test given its safety, simplicity of application.
- Hospitalized patients presented a higher score when compared to other populations.

**OUTPATIENT PHYSIOTHERAPY REHABILITATION FOR TOTAL HIP REPLACEMENT: IS CURRENT PRACTICE IN AUSTRALIA EVIDENCE-BASED?**

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R5-2, Meeting Room C4.2, October 19, 2017, 11:25 AM - 12:10 PM

**Aim:**

This study aimed to: (1) Establish current practice with respect to referral patterns, content, timing, duration and frequency of physiotherapy rehabilitation for total hip replacement (THR) patients following hospital discharge in Australia; and (2) determine if current practice is evidence-based?

**Design:**

An online self-administered questionnaire.

**Method:**

301 facilities performing >20 THRs per year were contacted to request consent to participate in the study. The questionnaire was electronically distributed to 151 Australian physiotherapists across 131 facilities.

**Results:**

A response rate of 77% (116/151) was obtained. Results indicated that current practice for rehabilitation of THR patients following hospital discharge in Australia generally consists of: referral for physiotherapy following hospital discharge, three to four total sessions at a frequency one to two times per fortnight; programs commence within two weeks of hospital discharge and last five to six weeks; sessions include strengthening with/without resistance, education, gait re-training, stairs practice and hip range of motion exercises; physiotherapy sessions are complemented by a home exercise program. The fact that most THR patients are referred for outpatient physiotherapy following hospital discharge and are provided with a home exercise program aligns with current evidence. The inconsistent use of resistance in strength training does not align with current evidence. There is insufficient literature pertaining to content, timing, frequency and duration to advise whether current practice regarding these aspects is evidence-based.

**Conclusion/Key Practice Points:**

- Current practice for THR rehabilitation in Australia has been defined as above.
- There is limited evidence to suggest current practice is evidence-based.

## DISEASE IMPACT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) ON COGNITIVE AND PHYSICAL PERFORMANCE

**Ngai S<sup>1</sup>**

<sup>1</sup>*Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hung Hom, Hong Kong*

R5-2, Meeting Room C4.2, October 19, 2017, 11:25 AM - 12:10 PM

### Aim:

To examine the impact of COPD on domain-specific cognitive performance and physical function in people with COPD.

### Design:

Case-control study

### Method:

Eleven people with COPD (%predFEV1=54±14%) and eleven age, gender and education level matched healthy individuals (%predFEV1=100±13%) were recruited. All participants performed domain-specific cognitive tests including colour trail test (CTT), stroop colour and word test, calculation and digit span test to examine visuospatial attention, cognitive processing, executive function, working memory and verbal attention respectively. Physical function was assessed by 6-minute walk test (6MWT) and symptom-limited ergometry test. Independent t-test and Pearson's correlation was used to examine between-group difference and association between cognitive and physical performance respectively.

### Results:

With the similar level of education background, people with COPD was found to require longer time to complete CTT (part1: 41±17seconds, p=0.034 and part2: 38±18seconds, p=0.049), stroop colour and word test (12±5seconds, p=0.049), calculation (30±17seconds, p=0.096) and lower level in digit span forward test (1±0.4, p=0.048) than healthy individuals. People with COPD walked significantly shorter distance in 6MWT (6MWD) (-180±48meters, p=0.001) and lower work rate in ergometry (-21±9watts, p=0.032). 6MWD was found to be associated with visuoattention (CTT, r=-0.44 to -0.52, p<0.05), cognitive processing (colour stroop and word test, r=-0.71, p<0.001) and executive function (calculation, r=-0.69, p<0.001). Similar significant association was found between ergometry workrate and domain-specific cognitive tasks (p<0.05).

### Conclusion:

These findings suggested that people with COPD demonstrated significantly lower domain-specific cognitive performance. Besides, some specific cognitive performance was found to be moderately and strongly associated with physical function suggesting that COPD affects both cognitive and physical performance in the victims.

Funding source: Research Grants Council (Project#25103015)

## MAKING SENSE OF SENSORY ASSESSMENT: HOW TO ASSESS SENSORY FUNCTIONING IN CHILDREN WITH LANGUAGE DISORDER

**Nicola K<sup>1</sup>**, Watter P<sup>1</sup>

<sup>1</sup>*The University of Queensland, St Lucia, Australia*

R5-2, Meeting Room C4.2, October 19, 2017, 11:25 AM - 12:10 PM

### Aim:

To understand the clinical application of ocular-motor, vestibular, tactile, proprioceptive and motor planning assessment of children with language disorders.

### Design:

A retrospective review of chart files.

### Method:

All children enrolled in a Queensland private school verified under the speech-language impairment category of The Education Adjustment Program, and diagnosed with a specific language impairment were included. Files were reviewed to obtain sensory assessments used, along with performance on these tests.

#### Results:

A well-used clinical measure, the Neurodevelopmental Physiotherapy Assessment, was utilised to assess sensory functioning including: ocular-motor, vestibular, tactile, proprioception and motor planning. This clinical assessment was used with a graded score of 1 to 5, and was modified to accommodate children with language impairment. The final study group (n = 107, males = 82) included children 4 to 14 years old with specific language impairment. Overall, 74% of children had sensory problems with motor planning (78%), vestibular (63%) and proprioception (58%) most affected.

#### Conclusion/Key Practice Points:

- Physiotherapists at this school use a clinical assessment to evaluate children's sensory functioning.
- Specific to this cohort of children, physiotherapy sensory assessments must be administered with an understanding of modifying typical communication to enhance the child's understanding and overall test validity.
- A subgroup of children with severe specific language impairment will also present with sensory problems.

#### PRELIMINARY CASE SERIES EVALUATING SAFETY AND IMMEDIATE TO SHORT-TERM CLINICAL BEBENEFITS OF JOINT MOBILIZATION IN LOWER LIMB HAEMOPHILIC ARTHRITIS

**Scaddan E<sup>1</sup>**, O'Leary S<sup>1,2</sup>, Rowell J<sup>1,3</sup>

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<sup>3</sup>Queensland Haemophilia Centre, Brisbane, Australia

R5-2, Meeting Room C4.2, October 19, 2017, 11:25 AM - 12:10 PM

#### Aim:

Arthritis resulting from recurrent intra-articular bleeding in individuals with hemophilia can lead to severely debilitating arthritis. Symptoms include joint pain and stiffness with subsequent loss of mobility and function. Very limited studies have investigated the effects of joint mobilization for this condition. This case series is a preliminary investigation of safety, as well as immediate and short-term clinical benefits, associated with gentle knee and ankle joint mobilization in people with hemophilic arthropathy.

#### Design:

A single intervention of joint mobilization was applied to the subjects affected knees and/or ankles within a public hospital setting. Outcome measures included adverse events, as well as immediate effect of the intervention (pain-free passive joint range, Timed Up and Go Test with maximum pain numerical rating scale) and short-term effect (Lower Extremity Functional Scale).

#### Methods:

Sixteen adults with severe or moderate hemophilia and radiologically confirmed arthritis were recruited from within the Brisbane region. Effects of the intervention were evaluated with a repeated measures ANOVA.

**Results:** There were no adverse events. An immediate significant increase was observed in pain-free passive ankle joint range of motion ( $p < 0.05$ ) following the joint mobilization intervention.

#### Conclusion/Key Practice Points:

- The findings of this case series suggest that gentle joint mobilization techniques may be safely considered as part of a multimodal management approach for hemophilic arthropathy.

## CONCUSSION HISTORY AND SENSORIMOTOR TESTS PREDICT HEAD/NECK INJURIES IN FOOTBALLERS

**Hides J<sup>1,2</sup>**, Smith M<sup>1</sup>, Mendis D<sup>1,7</sup>, Treleaven J<sup>3</sup>, Rotstein A<sup>4</sup>, Sexton C<sup>1</sup>, Low Choy N<sup>5</sup>, McCrory P<sup>6</sup>

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SPA2, Darling Harbour Theatre, October 19, 2017, 11:25 AM - 12:10 PM

### Aim:

To investigate if a history of sports related concussion (SRC) and pre-season sensorimotor performance predict season head/neck injuries.

### Design:

Prospective cohort design

### Method:

One hundred and ninety male football players from three football codes participated. Pre-season assessments included self-report of SRC within the previous 12 months and physical measures of sensorimotor function. Head/neck injury data were collected in the playing season.

### Results:

Forty-seven players (25%) reported a history of SRC. A history of concussion was related to changes in size and contraction of trunk muscles. Twenty-two (11.6%) players sustained a head/neck injury during the playing season. Predictors of season head/neck injuries included history of SRC, contraction of trunk muscles and increased error associated with cervical proprioception. Five risk factors were identified and players with three or more of these had 14 times greater risk of sustaining a season neck/head injury (sensitivity of 75% and specificity of 82.5%) than players with 2 or fewer risk factors.

### Conclusion/ Key Practice Points:

- The modifiable risk factors identified could be used to screen football players in the pre-season and guide development of exercise programs aimed at injury reduction.

## PROSPECTIVE INVESTIGATION OF CHANGES IN THE SENSORIMOTOR SYSTEM FOLLOWING SPORTS-RELATED CONCUSSION: AN EXPLORATORY STUDY

**Mendis D<sup>1,2</sup>**, Hides J<sup>1,3</sup>, Franettovich Smith M<sup>1</sup>, Smith N<sup>1</sup>, Cooper A<sup>1</sup>, Treleaven J<sup>4</sup>, Leung F<sup>1</sup>, Gardner A<sup>5</sup>, McCrory P<sup>6</sup>, Low Choy N<sup>7</sup>

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SPA2, Darling Harbour Theatre, October 19, 2017, 11:25 AM - 12:10 PM

### Aim:

To investigate changes in sensorimotor function in the acute phase following sports-related concussion.

### Design:

A prospective cohort study employing a pre-season/baseline and post-concussion assessment design was conducted.

#### Method:

Fifty-four elite rugby union and rugby league players were assessed at the start of the playing season. Players who sustained a concussion during the season were assessed three to five days post-injury. Assessments included a self-report questionnaire (Dizziness Handicap Inventory) and physical measures of sensorimotor function: balance (sway velocity), vestibular system function (vestibular ocular reflex gain; right-left asymmetry), cervical proprioception (joint position error) and trunk muscle size and function.

#### Results:

11 sets of pre and post-concussion data were available for analysis. Significantly decreased sway velocity ( $p = 0.02$ , effect size = 0.6) and increased size and contraction of trunk muscles were identified ( $p < 0.05$ , effect size = 0.5-0.6). No significant differences were found pre- and post-concussion for testing of the vestibular system and cervical proprioception.

#### Conclusion/ Key Practice Points:

- Specific deficits of the sensorimotor system were present 3-5 days post-sports related concussion.
- Physiotherapy intervention may be required following sports-related concussion injury.

#### **AUTOMATED PUPILLOMETRY FOLLOWING CONCUSSION IN NATIONAL RUGBY LEAGUE PLAYERS: A USEFUL ASSESSMENT TOOL?**

**Brown D<sup>1</sup>**, Evans K<sup>1</sup>, Condon G<sup>2</sup>, Grant G<sup>1</sup>

<sup>1</sup>Griffith University, Gold Coast, Australia, <sup>2</sup>Gold Coast Titans NRL, Gold Coast, Australia

SPA2, Darling Harbour Theatre, October 19, 2017, 11:25 AM - 12:10 PM

#### Aim:

To investigate whether parameters of the pupil light reflex are affected following a sport-related concussion.

#### Design:

Observational study.

#### Method:

Pupillometry (NPi-200, NeurOptics) data from 60 National Rugby League players (age  $22 \pm 4$  years) were collected during the pre-season period and random sampling continued during the season. For players who sustained a concussion, data were collected between 0-hours and 8-days post-concussion. The protocol involved repeated measures of neurological pupil index, pupil diameter, latency of pupil constriction, and velocity of both constriction and dilation for each eye.

#### Results:

During the first six rounds of the competition season, five players were diagnosed with concussion. Significant differences ( $p < 0.05$ ) in pre- and post-concussion values were observed for minimum pupil diameter in four out of five players; dilation velocity in one player; and resting diameter in one player. Greater variability was observed in these parameters in the concussion group than in the non-concussion group.

#### Conclusion/Key Practice Points:

- These preliminary findings suggest that automated pupillometry may be useful for detecting changes in specific pupil light reflex parameters following sport-related concussion.
- Minimum diameter of the pupil was the variable most frequently affected following concussion and may represent impairment in autonomic nervous system function.
- Individual differences in variables pre- and post-concussion were noted highlighting the need for within-individual comparisons.
- The NPi-200 is a portable, simple, relatively-inexpensive device that may aid decision making in the diagnosis and return to sport following concussion.

## IS PELVIC FLOOR MUSCLE TRAINING A PHYSICAL THERAPY OR A BEHAVIOURAL THERAPY? A CALL TO NAME AND REPORT THE PHYSICAL, COGNITIVE AND BEHAVIORAL ELEMENTS OF THIS THERAPY

**Frawley H<sup>1,2</sup>**

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WMPH2, Meeting Room C4.4, October 19, 2017, 11:25 AM - 12:10 PM

This presentation is based on:

Frawley, H. C., Dean, S., Slade, S., & Hay-Smith, E. J. (2017). Is pelvic floor muscle training a physical therapy or a behavioural therapy? *Physical Therapy*, 97(4), 425-437. doi: <https://doi.org/10.1093/ptj/pzx006>

This presentation will explore whether pelvic-floor muscle training (PFMT) for the management of female urinary incontinence and prolapse is a physical therapy or a behavioural therapy. The primary aim is to demonstrate that it is both. A secondary aim is to show that the plethora of terms used for PFMT is potentially confusing and that current terminology inadequately represents the full intent, content, and delivery of this complex intervention. While physiotherapists may be familiar with exercise terms, the details are often incompletely reported; furthermore, physiotherapists are less familiar with the terminology used in accurately representing cognitive and behavioural therapy interventions, which results in these elements being even less well reported. Thus, an additional aim is to provide greater clarity in the terminology used in the reporting of PFMT interventions, specifically, descriptions of the exercise and behavioural elements. First, PFMT is described as a physical therapy and as an exercise therapy informed predominantly by the discipline of physiotherapy. However, effective implementation requires use of the cognitive and behavioural perspectives of the discipline of psychology. Second, the theoretical underpinning of the psychology-informed elements of PFMT is summarized. Third, to address some identified limitations and confusion in current terminology and reporting, recommendations for ways in which physiotherapists can incorporate the psychology-informed elements of PFMT alongside the more familiar exercise therapy-informed elements are made. Fourth, an example of how both elements can be described and reported in a PFMT intervention is provided. In summary, this presentation will explore the underlying concepts of PFMT to demonstrate that it is both a physical intervention and a behavioural intervention and that it can and should be described as such, and an example of the integration of these elements into clinical practice is provided.

### Key Practice Points

- A case study example of the application of this proposal into clinical practice will be provided.

## HELP-SEEKING BEHAVIOUR FOR PELVIC FLOOR DYSFUNCTION IN WOMEN OVER 55 YEARS OF AGE: THE DRIVERS, BARRIERS AND PRESENCE OF DYSFUNCTION

**Thompson J<sup>1</sup>**, Tinetti A<sup>1</sup>, Weir N<sup>1</sup>, Tangyotkajohn U<sup>1</sup>, Jaques A<sup>1</sup>, Briffa K<sup>1</sup>

<sup>1</sup>Curtin University, Perth, Australia

WMPH2, Meeting Room C4.4, October 19, 2017, 11:25 AM - 12:10 PM

### Aim:

To identify help-seeking behaviour, drivers and barriers of older women living independently in Australia with pelvic floor dysfunction.

### Design:

Cross-sectional study using electronic and paper questionnaires.

### Method:

Women (n=376) ≥55 years, were recruited during July-August 2016. Bladder, bowel, pelvic organ prolapse and sexual dysfunction were assessed with the Australian Pelvic Floor Questionnaire. Help-seeking behaviours, drivers and barriers were based on the Barriers to Incontinence Care Seeking Questionnaire. Univariate analyses were used to assess any significant relationships between PFD, age, education level, self-reported PFD, barriers and drivers on help-seeking behaviours.

#### Results:

Of the 376 women (mean [SD] age 68.6 [10.5] years) included in the study 67% reported symptoms of pelvic floor dysfunction and 98.7% scored >0 on the questionnaire. Women were more likely to seek help if they scored higher on the questionnaire ( $p<0.001$ ). The main barrier to seeking help was the perception of pelvic floor dysfunction being normal part of ageing (22.4%). Of those who did seek help (50%) the main factor was increased level of symptom bother (51.4%). No difference in age, weight or education level detected between those women who did and those who did not seek help for dysfunction.

#### Conclusion/Key Practice Points:

- Women are more likely to seek help if scoring higher on the questionnaire or symptoms are becoming more bothersome, and less likely to seek help if they view their symptoms as normal.
- Future direction should be taken to raise awareness of normal pelvic floor function as well as the availability of help for dysfunction.

#### DRY NEEDLING FOR LBP: IS THERE A POINT?

**Forsberg J<sup>1</sup>**

<sup>1</sup>Select Physio, Australia

ADN3, Meeting Room C4.6, October 19, 2017, 1:15 PM - 2:00 PM

#### Outline:

80% of the population suffer low back pain at some point in time. There are many possible treatment modalities for the complaint. Acupuncture is traditionally defined as the practice of inserting needles into the body at specific points to reduce pain. Two particular distinctions between Western medical acupuncture and Chinese Medicine acupuncture are that western medical acupuncture does not involve the traditional concepts of meridian or Yin and Yang. Dry needling is similar to western acupuncture in terms of not using any concepts of meridians or Yin and Yang. Dry needling purely addresses the neuromuscular dysfunction via myofascial trigger points or non-myofascial trigger points to address pain.

Current research will be presented recommending Western medical acupuncture and dry needling for low back pain.

#### Key Practice Points:

- Learn about Dry Needling styles
- What does the evidence say?
- Dry Needling VS multimodal treatment.

#### NEEDLING IN THE SHOULDER REGION, LATEST EVIDENCE, SAFETY CONCERNS AND PRACTICAL TECHNIQUES

**McCutcheon L<sup>1</sup>**

<sup>1</sup>Bond University, Australia

ADN3, Meeting Room C4.6, October 19, 2017, 1:15 PM - 2:00 PM

#### Background:

A literature review of acupuncture and dry needling treatment as a modality for treating various conditions in the shoulder region will be presented. Safety relating to needling practice in the shoulder region will also be considered. Suitable participants are physiotherapists who have completed the minimum training required in the area of acupuncture and dry needling, although this is not an absolute requirement.

#### Aims/ objectives:

o review the latest literature and consider safety and precautions relevant to needling in the shoulder and the associated thoracic region as well as present some more advanced practical techniques.

#### Approach:

The presentation will include a PowerPoint presentation and practical demonstrations designed to address the complexities associated with needling the shoulder region.

#### Key Practice Points:

- At the conclusion of the session participants should be able to assess the risk and benefits of using needling therapies to accompany a multimodal approach for treating various conditions in the shoulder region.

### THE TREATMENT AND MANAGEMENT OF ATAXIA IN AQUATIC PHYSIOTHERAPY: FROM CLINICAL PRACTICE TO RESEARCH

**Milne S<sup>1,2,3</sup>**

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AG3, Meeting Room C3.5, October 19, 2017, 1:15 PM - 2:00 PM

Friedreich ataxia (FRDA) is a genetic neurodegenerative disease affecting 1 in 30,000 Caucasians. Progressive gait ataxia, muscle weakness and spasticity have a significant impact on the ability to perform activities of daily living and quality of life for individuals with FRDA. Primary treatment of FRDA is based on symptom management and maintenance of function, yet there is limited evidence to support physiotherapy. This presentation aims to describe a transition from clinical care to research in individuals with FRDA. The secondary objective is to provide a description and rationale for aquatic physiotherapy intervention for ambulant and non-ambulant individuals with FRDA.

A retrospective evaluation of past clinical care and obtaining consensus from other expert-clinicians to develop research interventions, were two beneficial actions for transitioning from clinical work to research. As a result, a randomised controlled trial (RCT) to examine the effects of land and aquatic physiotherapy was developed. The aquatic physiotherapy treatment in the RCT was based in each of seven domains considered relevant to ataxia: coordination and control; functional mobility, strengthening, cardiovascular fitness, postural control, balance training, and stretching and mobilising. The motor domain of the Functional Independence Measure and the Friedreich Ataxia Impact Scale were used to evaluate the effectiveness of the intervention.

The RCT found that a combination of land and aquatic physiotherapy improves both function and health and wellbeing of individuals with FRDA. This provides evidence that short-term, intensive outpatient physiotherapy should be offered to individuals with FRDA.

#### Key Practice Points

- Aquatic physiotherapy should be considered in the rehabilitation of both ambulant and non-ambulant individuals with Friedreich ataxia.
- Combining clinical care and research provides opportunities to evaluate and inform clinical care.

### DOES HYDROTHERAPY HAVE A POSITIVE IMPACT ON THE WELLBEING OF CHILDREN WITH AUTISM SPECTRUM DISORDER?

**Mills W<sup>1</sup>**, Kondakis N<sup>1</sup>, Milne N<sup>1</sup>, Orr R<sup>1</sup>, Warburton M<sup>2</sup>

<sup>1</sup>Bond University, Gold Coast, Australia, <sup>2</sup>Gateway Physiotherapy, Brisbane, Australia

AG3, Meeting Room C3.5, October 19, 2017, 1:15 PM - 2:00 PM

#### Aim:

To investigate the effectiveness of a four-week hydrotherapy program aimed at improving social, psychological, and emotional wellbeing of children with Autism Spectrum Disorder.

#### Design:

Within-subjects, randomised crossover trial where children with Autism Spectrum Disorder participated in the four-week intervention period and a four-week control period.

#### Method:

Eight children (males: n = 6; females: n = 2, mean age = 8.72 ± 1.99 years) with Autism Spectrum Disorder were randomised into two groups (Group 1, n = 4; Group 2, n = 4). Each child participated in a 45-minute hydrotherapy session (intervention), once weekly for four weeks. Parents completed the Child Behaviour Checklist at weeks 0,4, and 8 to measure changes in wellbeing during intervention and control periods. Mean change scores for intervention and control periods were compared using paired samples t-tests.

#### Results:

Significant differences in mean change scores for: Total Problems (p = 0.03) domain, Internalising Problems domain (p = 0.05), Anxious/Depressed syndrome (p = 0.05) and Attention Problems syndrome (p = 0.03) were found suggesting an improvement during the intervention period above that of the control period.

#### Conclusion:

Hydrotherapy can enhance emotional and psychological wellbeing of children with Autism Spectrum Disorder and could be considered as a beneficial therapy option, either alone or in conjunction with other therapy modalities.

#### Key Practice Points:

- Hydrotherapy may be appropriate, independently or as an adjunct therapy, for children with Autism Spectrum Disorder to benefit their emotional and psychological wellbeing.
- If used, one-on-one hydrotherapy sessions are recommended.

### FOAL MOTOR DEVELOPMENT

#### Hyytiäinen H<sup>1</sup>

<sup>1</sup>*Veterinary Teaching Hospital, Department of Equine and Small Animal Medicine, Faculty of Veterinary Medicine, University of Helsinki, Helsinki, Finland*

APG3, Meeting Room C3.4, October 19, 2017, 1:15 PM - 2:00 PM

Unlike in human babies, for foals there are no reported normal values regarding their motor development – not for the speed nor for the different factors of it. To date, only scarce publications relating to random aspects of foals' motor development exists. Stability and postural balance is one of the reported factors. There are clear changes in the amplitude, velocity and frequency of the sway in a standing foal, during the first three months of their lives (Nauwelaerts et al. 2013). Some kinematic values in a foal (such as duration of swing phase, range of protraction and retraction as well as tarsal flexion) have been reported, and noted to predict the locomotion of an adult horse (Back et al. 1995). Laterality is one of the most studied aspects of foals' motor function. It has been studied through the suckling behaviour (Komárková et al. 2013), and through the ability to perform a circle in trot (Lucidi et al. 2013). Further, a relationship between laterality and body conformation and asymmetrical limbs has been reported (van Heel et al. 2010). Spontaneous locomotion activity of foals has also been reported, and in addition to the distribution of activities over time, also a change in the level of activity during the first month of their lives was noted –older foals move less (Kurvers et al 2006). Currently, further studies on healthy as well as ailing foals motor development are being done (Pirinen et al 2017).

A review and some new information regarding foal motor development –the basis of equine neonatal physiotherapy, will be provided. This will give the participants advanced knowledge and understanding in the matter, to support the clinical reasoning process when treating foals.

### THE IMPACT OF DISABILITY IN SURVIVORS OF CRITICAL CARE

#### Hodgson C

CRP3, Meeting Room C4.4, October 19, 2017, 1:15 PM - 2:00 PM

Survivors of intensive care often experience long-term physical, cognitive and mental health impairments known as post-intensive care syndrome. While the impact of critical illness is profound, there are limitations in our ability to assess functional recovery of survivors in person, with many studies reporting large amounts of loss to follow up. The number of patients with ongoing disability, and the relationship between health-

related quality of life and disability, is poorly described. The quality of survival following critical illness has been identified as one of the largest health challenges for these patients, and The World Health Organisation's International Classification of Functioning, Disability and Health defines disability as "difficulties in any area of functioning as they relate to environmental and personal factors". We followed 262 Australian survivors for six months after their ICU admission and found that disability was prevalent. Predictors of moderate or severe disability included a prior history of anxiety or depression, separation or divorce and a longer duration of mechanical ventilation.

## BACK TO THE FUTURE: ARE YOU PREPARED

**O'Connell J<sup>1</sup>**

<sup>1</sup>Charles Sturt University, Perth, Australia

EDU3, Meeting Room C4.11, October 19, 2017, 1:15 PM - 2:00 PM

### Outline:

Our professional workplaces and organisations are immersed in a momentum of change, requiring innovators and leaders who help shape the future of physiotherapy in Australia. This requires a transformation in our education strategies and professional communication practices. October 21 celebrates "back to the future" day, and the time discursive timeline of events of Marty McFly using Doc Browns time-jumping car. The trick is to be in control and plan to be ready for the future. Let us consider the skills and techniques needed to pick up momentum in digitally informed environments. How do we work, learn and communicate online? What do we need to understand in terms of digital scholarship? How do we cope with the influences of the internet on education and learning needs, and how do we grapple with communication avenues, information management and .....just keeping connected. Come back to the future as we talk about education and online learning, and see if you are prepared for the future!

### Key Practice Points:

- Digital scholarship
- Social media
- Communication and collaboration
- Information curation
- Knowledge networks

## EXERCISE AS THE MAIN COURSE RATHER THAN DESSERT: IMPROVING EXERCISE PRESCRIPTION FOR TENDINOPATHY

**Malliaras P<sup>1</sup>**, Barton C<sup>2</sup>, Vicenzino B<sup>3</sup>

<sup>1</sup>Monash University, Frankston, Australia, <sup>2</sup>La Trobe University, Bundoora, Australia, <sup>3</sup>University of Queensland, St Lucia, Australia

MPA3A, Meeting Room C3.3, October 19, 2017, 1:15 PM - 2:00 PM

### Background:

Physiotherapists prescribe exercise in many areas of practice where there is strong evidence (e.g. osteoarthritis). In other areas, the benefits of exercise have been challenged. Exercise as a first line treatment for rotator cuff tendinopathy was challenged by a 2016 Cochrane review that concluded exercise may be no different to placebo. This session will explore the exercise evidence base for common tendinopathies (rotator cuff and Achilles tendinopathy), and practical tools to optimise the effectiveness of physiotherapy-delivered exercise interventions.

### Aims and Objectives:

The aim of this session is to improve physiotherapists' knowledge and skills in prescribing exercise interventions for tendinopathy. The objectives are to: 1) outline the strength of the rotator cuff and Achilles tendinopathy exercise evidence; 2) explore exercise parameters that may improve outcomes; 3) outline fundamental principles and skills to improve tendinopathy exercise outcomes and maximize adherence; and 4) demonstrate how education and contextual factors influence successful tendinopathy exercise prescription.

#### Approach:

A summary of the current tendinopathy exercise evidence will be presented, highlighting fundamental parameters, and how gaps in the literature may be navigated, using rotator cuff and Achilles tendinopathy as examples. This will be combined with discussion (including invited discussion from delegates) of current exercise prescription and adherence literature, within the context of tendinopathy management. Finally, contextual factors and specific education targeted to potential psychosocial barriers from the tendinopathy literature will be discussed.

#### Key Practice Points:

- Practical tips will be provided to optimize exercise outcomes
- Evidence-based knowledge integrated into practical application
- Exercise prescription considerations for tendinopathy discussion.

### PHYSIOTHERAPY PRIMARY CARE INTERFACE WITH PEOPLE WITH SEVERE MENTAL ILLNESS

**Lee S<sup>1</sup>**, Waters F<sup>2,3</sup>, Briffa K<sup>1</sup>, Fary R<sup>1</sup>

<sup>1</sup>*School of Physiotherapy and Exercise Science, Curtin University, Perth, Australia*, <sup>2</sup>*Clinical Research Centre, Graylands Campus, North Metropolitan Health Service Mental Health, Perth, Australia*, <sup>3</sup>*School of Psychiatry and Clinical Neurosciences, University of Western Australia, Perth, Australia*

MPA3B, Meeting Room C4.8, October 19, 2017, 1:15 PM - 2:00 PM

#### Aim:

To investigate factors influencing access to physiotherapy for physical healthcare by people with severe mental illness from the perspectives of mental health professionals and individuals with severe mental illness.

#### Design:

Qualitative study.

#### Method:

Twenty-four mental health professionals and 35 individuals with severe mental illness participated. Focus groups and interviews with mental health professionals (North Metropolitan Mental Health Service) and individuals with severe mental illness (community in Perth) were conducted. Focus groups and interviews explored participants' understanding of the role of physiotherapy in mental healthcare, along with barriers and enablers to service access. Transcripts were analysed using an inductive approach to derive key themes. Recruitment continued until saturation of themes was achieved.

#### Results:

Participants expressed limited understanding of the role and relevance of physiotherapy. Additional common barriers and respective enablers to service access related to financial costs, transport, and lack of motivation and education about physiotherapy. Structural influences and the perceived lack of mental health knowledge by physiotherapists influenced referrals from mental health professionals. Potential enablers to greater physiotherapy access were mental health education for physiotherapists and advocacy for physiotherapy within mental health.

#### Conclusion:

- Physiotherapists in primary care can play a critical role in facilitating better physical health of people with severe mental illness through individualised exercise programs and management of musculoskeletal, cardiovascular and respiratory conditions.
- This study highlights a need for physiotherapy presence and advocacy within mental healthcare.
- Education about physiotherapy among stakeholders, and education about mental health for physiotherapists may enable greater physiotherapy involvement.

## A CROSS SECTIONAL STUDY OF PSYCHOLOGICAL FEATURES IN INDIVIDUALS WITH PATELLOFEMORAL PAIN

**Maclachlan L<sup>1</sup>**, Matthews M<sup>1</sup>, Collins N<sup>1</sup>, Hodges P<sup>1</sup>, Vicenzino B<sup>1</sup>

<sup>1</sup>The School of Health and Rehabilitation Sciences, The University Of Queensland, Brisbane, Australia

MPA3B, Meeting Room C4.8, October 19, 2017, 1:15 PM - 2:00 PM

### Aim:

The three study aims were to: 1) compare psychological profiles between individuals with and without patellofemoral pain; 2) compare psychological profiles, disability and pain severity between subgroups with different levels of patellofemoral pain severity; and 3) explore relationships between psychological factors, pain and disability in this condition.

### Design:

Cross-sectional study.

### Method:

100 participants (72 females, mean±SD age 27±5 years, BMI 25.3±4.8 kg/m<sup>2</sup>) with non-traumatic patellofemoral pain completed measures of pain severity, disability, kinesiophobia, catastrophizing, anxiety and depression. The patellofemoral group were partitioned into less- and more-severe groups using K-means cluster analysis of all sub-scales of the Knee injury and Osteoarthritis Outcome Score (KOOS). 50 pain-free controls, matched by sex, age and activity level (36 females, age 27±5, BMI 22.9±4.46) also completed psychological measures.

### Results:

Overall, there were no differences in psychological features between patellofemoral pain and pain-free groups. When sub-grouped by severity, the more-severe patellofemoral pain group demonstrated significantly higher levels of depression and catastrophizing than pain-free controls ( $p < 0.01$ ). When compared to the less-severe cases of patellofemoral pain, the more severe group had significantly higher pain severity, kinesiophobia, depression, catastrophizing and disability ( $p < 0.01$ ). The only significant correlation was that between kinesiophobia and knee-related quality of life ( $r = -0.6$ ;  $p = < 0.0001$ ).

### Conclusion/Key Practice Points:

- Physiotherapists assessing and managing patellofemoral pain need to be aware of the link between physical and psychological presentations.
- The presence of high levels of pain and disability in patients presenting with more severe patellofemoral pain warrants early consideration of psychological factors.

## PHYSIOTHERAPISTS' PERSPECTIVES AND EXPERIENCES OF DELIVERING A PSYCHOLOGICAL INTERVENTION AS PART OF A RANDOMISED CONTROLLED TRIAL FOR ACUTE WHIPLASH

**Kelly J<sup>1</sup>**, Ritchie C<sup>1</sup>, Sterling M<sup>1</sup>

<sup>1</sup>Recover Injury Research Centre, NHMRC Centre of Research Excellence in Recovery Following Road Traffic Injuries, Menzies Health Institute Queensland, Griffith University, Southport, Australia

MPA3B, Meeting Room C4.8, October 19, 2017, 1:15 PM - 2:00 PM

### Aim:

To investigate physiotherapists' perspectives and experiences of delivering a novel psychological intervention (stress inoculation training) as part of a randomised controlled trial (StressModEx) targeting adults with acute whiplash injury.

### Design:

A qualitative design was used.

### Method:

Participants were physiotherapists ( $n=11$ ) who had been trained and accredited to perform stress inoculation training, and had delivered the program as part of StressModEx. Semi-structured audio-recorded interviews

were conducted, transcribed verbatim, independently reviewed, and analysed using an inductive thematic approach.

#### Results:

All eligible physiotherapists were recruited. Participants were of mean age 48 years (SD 8.1), 64% male, and had an average of 22 years (SD 9.3) clinical experience. Physiotherapists were positive about their experiences delivering stress inoculation training and felt it had improved patient outcomes. Prior experience and confluence with biomedical explanations influenced confidence with specific components of stress inoculation training. Abdominal breathing and body scanning were preferred whereas, coping statement and problem solving sessions were difficult for most physiotherapists to deliver. Physiotherapists expressed a desire to be the problem solver, experienced challenges engaging patients who were not forthcoming with a problem to solve, and had an inclination to solve only physiotherapy-related problems rather than teaching problem solving as a skill.

#### Conclusions:

- Participants identified the program as offering a new strategy for managing people with pain and felt it had improved their ability to manage psychosocial contributors to an individual's pain presentation.
- To improve delivery of the program's problem solving and coping statement sessions, participants suggested extended mentoring by a psychologist.

### DOES DEPRESSION MODERATE THE RELATIONSHIP BETWEEN WEIGHT-LOSS AND RESPONSE OF OVERWEIGHT PARTICIPANTS FOLLOWING A NON-SURGICAL CHRONIC CARE PROGRAM FOR OSTEOARTHRITIS?

**Eyles J<sup>1,2,3</sup>**, Mills K<sup>4</sup>, Hunter D<sup>1,2</sup>

<sup>1</sup>Institute Of Bone & Joint Research, Kolling Institute, University Of Sydney, St Leonards, Australia,

<sup>2</sup>Department of Rheumatology, Royal North Shore Hospital and Northern Clinical School, University of Sydney, Australia. , St Leonards, Australia, <sup>3</sup>Physiotherapy Department, Royal North Shore Hospital, Sydney, Australia. , St Leonards, Australia, <sup>4</sup>Centre for Physical Health, Department of Medicine and Health Sciences, Macquarie University, Sydney, Australia., North Ryde, Australia

MPA3B, Meeting Room C4.8, October 19, 2017, 1:15 PM - 2:00 PM

#### Objective:

To determine if severe depressive symptoms moderate the relationship between weight-loss and response of overweight participants of a non-surgical chronic care program for hip and knee osteoarthritis.

#### Methods:

This prospective cohort study followed 670 overweight participants of the NSW Osteoarthritis Chronic Care program (OACCP) for 26-weeks. The OACCP aims to improve symptoms and quality of life of participants, emphasizing increasing physical activity and achieving/maintaining healthy weight. Severe depressive symptoms were defined as a score of  $\geq 21$  on the depression subscale of the Depression Anxiety Stress Scale. Response was defined as an 18% and 9-point improvement in Western Ontario and McMaster Universities Arthritis Index global score. Multivariate logistic regression models explored associations between weight-loss and response; interaction terms tested for possible moderating effects of severe depression. Ethics approval: NSLHD Reference - LNRI16/HAWKE/14.

#### Results:

Participants were of mean age 65.2 years, 63.7% female, 89.1% knee joint as primary complaint (signal joint), 37.3% were waitlisted for total joint arthroplasty (TJA). Weight-loss, signal joint, TJA waitlist and educational status, were independently associated with response, however severe depression was not ( $p = 0.062$ ). In the multivariate model; participants with severe depression demonstrated lower odds of responding to treatment compared with those without (OR 0.6, 95%CI 0.36, 0.99) when adjusting for weight loss, TJA waitlist status, signal joint, and six-minute walk test.

#### Conclusion/Key Practice Points:

- Although the odds were stacked against them, it was still possible for participants with severe depression to achieve weight-loss and symptomatic improvements following the OACCP.

## IMMUNOHISTOCHEMICAL ASSESSMENT OF SMALL FIBRE PATHOLOGY IN CHRONIC WHIPLASH ASSOCIATED DISORDER: PRELIMINARY FINDINGS OF A CASE-CONTROL STUDY

**Farrell S**<sup>1,2</sup>, Sterling M<sup>1,2</sup>, Irving-Rodgers H<sup>3</sup>, Schmid A<sup>4</sup>

<sup>1</sup>Recover Injury Research Centre, Griffith University, Southport, Australia, <sup>2</sup>NHMRC Centre of Research Excellence in Recovery Following Road Traffic Injuries, Griffith University, Southport, Australia, <sup>3</sup>School of Medical Science, Griffith University, Southport, Australia, <sup>4</sup>Nuffield Department of Clinical Neurosciences, University of Oxford, Oxford, United Kingdom

MPA3C, Meeting Room C4.9, October 19, 2017, 1:15 PM - 2:00 PM

### Aim:

To investigate the morphology of small sensory nerve fibres in chronic whiplash associated disorder (WAD).

### Design:

Case-control study.

### Method:

Ten individuals with chronic WAD (mean [SD] age 54.9 [7.4] years, six female) and ten age- and gender-matched pain free control individuals (mean [SD] age 54.1 [9.8] years, six female) were recruited. For each participant, a skin biopsy (3 mm diameter, 1-2 mm deep) was taken from the ventrolateral aspect of the proximal phalanx of the index finger (i.e. in a C7 spinal nerve innervated area) on the primary side of neck pain symptoms. Immunohistochemical processing of the biopsies was undertaken using primary antibodies to protein gene product 9.5 to allow assessment of intraepidermal nerve fibre density (IENFD). Data were analysed using Wilcoxon signed-rank testing ( $\alpha < 0.05$ ).

### Results:

Median (IQR) IENFD for the WAD group was 3.03 (4.32) fibres per mm of epidermis, and 7.69 (1.92) for the control group ( $p = 0.04$ ).

### Conclusion/Key Practice Points:

- These early findings suggest that structural pathology of small primary afferent nerve fibres may occur in patients with chronic WAD.
- Such structural changes may contribute to previously reported hypoesthesia in chronic WAD.
- These findings contribute to our appreciation of mechanisms underpinning chronic WAD.

## NERVE FIBRE PRESENCE IN CERVICAL SPINE MENISCOIDS AND JOINT CAPSULES: AN IMMUNOHISTOCHEMICAL INVESTIGATION

**Farrell S**<sup>1,2,3</sup>, Osmotherly P<sup>3</sup>, Cornwall J<sup>4,5,6</sup>, Rivett D<sup>3</sup>

<sup>1</sup>Recover Injury Research Centre, Griffith University, Southport, Australia, <sup>2</sup>NHMRC Centre of Research Excellence in Recovery Following Road Traffic Injuries, Griffith University, Southport, Australia, <sup>3</sup>School of Health Sciences, The University of Newcastle, Callaghan, Australia, <sup>4</sup>Graduate School of Nursing, Midwifery and Health, Victoria University of Wellington, Wellington, New Zealand, <sup>5</sup>Department of Physiology, University of Otago, Dunedin, New Zealand, <sup>6</sup>Institute for Health Sciences, Zurich University of Applied Sciences, Zurich, Switzerland

MPA3C, Meeting Room C4.9, October 19, 2017, 1:15 PM - 2:00 PM

### Aim:

To investigate the innervation of lateral atlantoaxial and cervical zygapophyseal joint meniscoids and adjacent joint capsules.

### Design:

Cross-sectional immunohistochemical study.

#### Method:

Twelve embalmed cadaveric hemispines (mean [SD] age 82.9 [6.5] years, six female, six left) were dissected, and the lateral atlantoaxial and cervical zygapophyseal joints (C2-3 to C6-7) disarticulated. Intra-articular meniscoids and adjacent joint capsules were excised, embedded in paraffin, sagittally sectioned (5 µm), and slide-mounted for immunohistochemical processing. Primary antisera to neurofilament heavy (NF-H) and pan-neurofilament (Pan-NF) were used to identify myelinated and unmyelinated nerve tissue, respectively.

#### Results:

Twenty-three meniscoids (and adjacent joint capsules) were removed from lateral atlantoaxial joints, and 54 from zygapophyseal joints. Sixty-four nerves were observed (26 NF-H, 38 Pan-NF) in 14 of the excised meniscoid-joint capsule specimens (ten from lateral atlantoaxial joints, four from zygapophyseal joints). Nerves immunoreactive to both NF-H and Pan-NF were observed in joint capsules adjacent to all 14 meniscoids. Nerves immunoreactive to Pan-NF were identified within the bodies of two meniscoids.

#### Conclusion/Key Practice Points:

- Nerves were found in lateral atlantoaxial and cervical zygapophyseal joint capsules, and in lateral atlantoaxial joint meniscoids.
- Nerves were morphologically consistent with A-delta and C fibres, which are involved in nociception.
- Findings suggest these structures may be potential sources of nociceptive input in neck pain.

### RESPONSIVENESS TO EXERCISE IN WHIPLASH: A QUALITATIVE STUDY

**Griffin A**<sup>1,2</sup>, Moloney N<sup>3</sup>, Leaver A<sup>1</sup>, Jagnoor J<sup>2,4</sup>, Michaleff Z<sup>4,5,6</sup>, Lin C<sup>5</sup>, Rebbeck T<sup>1,2</sup>

<sup>1</sup>Faculty of Health Sciences, The University of Sydney, Lidcombe, Australia, <sup>2</sup>John Walsh Centre for Rehabilitation Research, Royal North Shore Hospital, St Leonards, Australia, <sup>3</sup>Faculty of Medicine and Health Sciences, Macquarie University, Sydney, Australia, <sup>4</sup>The George Institute for Global Health, The University of Sydney, Sydney, Australia, <sup>5</sup>Sydney Medical School, The University of Sydney, Camperdown, Australia, <sup>6</sup>Arthritis Research UK Primary Care Centre, Research Institute for Primary Care and Health Sciences, Keele University, Staffordshire, England

MPA3C, Meeting Room C4.9, October 19, 2017, 1:15 PM - 2:00 PM

#### Aim:

To determine the characteristics of people with chronic whiplash that do and do not respond to exercise. Our secondary aims were to determine: (1) the factors that patients believe affect their responsiveness to exercise; (2) the factors that physiotherapists believe affect their patients' responsiveness to exercise.

#### Design:

Qualitative study consisting of in-depth semi-structured interviews exploring key beliefs around perceived responsiveness to exercise.

#### Method:

Interviews were conducted with 13 participants and 7 physiotherapists, previously involved in the exercise arm of a RCT that compared a comprehensive exercise program to simple advice. Participants were asked whether they responded to the exercise program, and why. Physiotherapists were asked to share their experiences about the characteristics of people that do not and not respond to exercise.

#### Results:

Individuals describing strong beliefs about the positive effects of physical activity were likely to respond to exercise interventions. The therapeutic relationship, and experiences around the immediate, demonstrable effectiveness of exercise were also identified as important factors affecting responsiveness to exercise.

#### Conclusion/Key Practice Points:

- Beliefs about exercise may be built upon or reinforced by the physiotherapist, through the early and immediate demonstration of changes in physical symptoms.
- The therapeutic relationship appears to have a significant influence on the patient's experience of exercise, and was perceived by many responders as a key contributor to their improvement.

## CONFIRMATORY FACTORY ANALYSIS OF THE NECK DISABILITY INDEX IN A WHIPLASH POPULATION INDICATES A ONE-FACTOR MODEL IS VIABLE

**Gabel C<sup>1</sup>**, Osbourne J<sup>3</sup>, Winklejohn S<sup>3</sup>, Barr S<sup>3</sup>, Melloh M<sup>4</sup>, Cuaesta A<sup>5</sup>

<sup>1</sup>Coolum Physiotherapy, Coolum Beach, Australia, <sup>2</sup>Griffith University, Gold Coast, Australia, <sup>3</sup>Department of statistics, Clemson University, Clemson, USA, <sup>4</sup>Zurich University, Winterthur, Switzerland, <sup>5</sup>Malaga University, Malaga, Spain

MPA3C, Meeting Room C4.9, October 19, 2017, 1:15 PM - 2:00 PM

### Aim:

Determining if the Neck Disability Index (NDI) is a valid patient reported outcome (PRO) in whiplash associated disorder (WAD) populations when analysed by confirmatory factor analysis (CFA); how does it compare to a non-WAD group and across genders.

### Design:

Retrospective analysis of pooled data

### Method:

Baseline-data for patients who completed the NDI from seven pooled studies with WAD (n=804; 69%=females) and non-WAD (n=963; 67%=females) was analyzed by CFA in the full samples and separate genders. Invariance analyses examined the NDI structure across the four groups used comparative fit indices (CFI).

### Results:

Across population and gender subgroups one-factor solutions consistently showed better model-fit over two-factor solutions. Multi-group analysis comparing WAD (n=792) and non-WAD (n=963) indicated slightly lowered fit once factor-loadings were constrained to be equal across groups ( $\Delta\chi^2_{\text{Unconstrained-vs-Metric}}(9)=32.777, p<.001$ ;  $\square\text{CFI}=0.004$ ). Differences in standardized factor loadings between groups were not accompanied by significant CFI changes. The NDI is characterized as one-dimensional and invariant across multiple sub-groups. However results were ambiguous with both one- and two-factor models applicable.

### Conclusions/Key Practice Points:

- The NDI remains a valid PRO in WAD populations providing acceptable neck status measurement
- It is appropriate for basic functional assessment across genders.
- However, it is recommended both clinicians and researchers initiate the transition toward more rigorous and less ambiguous PROs for WAD patients and research.
- Future graduated movement toward other PROs should consider regional PROs and computerized decision support systems
- Transition will be achieved by concurrently measuring newer PROs and the NDI to establish conversion charts for scored data.

## EVIDENCE-BASED INTERVENTION TO PREVENT FALLS IN PARKINSON'S DISEASE

**Allen N<sup>1</sup>**

<sup>1</sup>The University of Sydney, Sydney, Australia

NNG/GPA3B, Meeting Room C4.5, October 19, 2017, 1:15 PM - 2:00 PM

### Background:

People with Parkinson's disease are twice as likely to fall as the general older population, and most fallers fall recurrently.

### Objectives:

This presentation will provide an overview of the latest evidence, and provide clinical recommendations, for non-pharmacological interventions aimed at reducing falls in people with Parkinson's disease.

### Results:

Many risk factors for falls have been identified in people with Parkinson's disease, and some of these, including poor balance, mobility, muscle strength, and cognition have the potential to be targeted with

intervention. Pooling results from randomised controlled trials shows that challenging balance exercises (including Tai Chi), progressive resistance exercises, and movement strategy training (including cueing) can be effective in reducing the frequency of falls in people with Parkinson's disease, however may not reduce the number of fallers. Furthermore, pragmatic studies where participants have performed exercise interventions with minimal supervision suggest that reductions in falls occur in those with milder disease severity, but not more severe disease. While most people with Parkinson's disease will develop cognitive impairment, research has excluded this group.

**Conclusion/Key Practice Points:**

- Exercise may reduce the number of falls in people with Parkinson's disease, but further work is required to determine if the number of people experiencing falls can be reduced.
- Exercise interventions should be implemented as early as possible in the disease process.
- As the disease progresses, and particularly in individuals with cognitive impairment, clinicians should proceed cautiously; exercise may need to be more closely supervised and multifactorial interventions including behavioural and environmental modifications can be considered.

## UNDERSTANDING PHYSICAL ACTIVITY BEHAVIOUR IN PEOPLE LIVING WITH PARKINSON'S DISEASE: A QUALITATIVE STUDY

**McGinley J<sup>1</sup>**, Danoudis M<sup>2</sup>, Bilney B<sup>3</sup>, Morris M<sup>4</sup>, Higgins R<sup>1</sup>

<sup>1</sup>University of Melbourne, Parkville, Australia, <sup>2</sup>Monash Health, Cheltenham, Australia, <sup>3</sup>Australian Catholic University, Ballarat, Australia, <sup>4</sup>La Trobe University, Bundoora, Australia

NNG/GPA3B, Meeting Room C4.5, October 19, 2017, 1:15 PM - 2:00 PM

**Aim:**

Parkinson's disease (PD) is a common, progressive, neurological condition that is increasing in prevalence and associated with high levels of physical inactivity. This study aimed to gain insights into the experience of physical activity (PA) and associated barriers and enablers in Australians living with PD.

**Design:**

Qualitative exploratory study with focus groups

**Method:**

Four focus groups were conducted with a convenience sample of 22 people with PD; 15 males, mean age 64.1 years (SD; 11.4), mean disease duration 6.8 years (SD 4.1). Participants attended in selected groups; young onset (n = 6), older onset (n = 8) and rural location (n = 8). Themes explored included knowledge and personal experiences of PA and facilitators and barriers. Data were audio-recorded and transcribed. A qualitative thematic analysis was conducted based on the COMB (Capability Opportunity Motivation Behaviour) model.

**Results:**

Participants described the interrelationships of capability, opportunity and motivation in terms of barriers and facilitators of sustained PA. Themes arising showed participants identified psychological capability as vital to maintaining activity levels. Access, time and information were barriers, and health professional advice, social support and peer mentors were important enablers. While intrinsic motivation was another powerful theme, shame and stigma were also identified as barriers to participation and disease acceptance as a facilitator.

**Conclusion/Key Practice Points:**

- Few interventions to increase PA in people with PD have shown long term sustained benefit
- A behavioural analysis of variables associated with continued PA in people with PD is needed to develop appropriate behavioural interventions.

## FITNESS TRAINING FOR CARDIORESPIRATORY CONDITIONING AFTER TRAUMATIC BRAIN INJURY: COCHRANE SYSTEMATIC REVIEW UPDATE

**Hassett L**<sup>1,2</sup>, Moseley A<sup>2</sup>, Harmer A<sup>1</sup>

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NNG3A, Meeting Room C4.7, October 19, 2017, 1:15 PM - 2:00 PM

### Aims:

To evaluate whether fitness training is safe and improves cardiorespiratory fitness and psychosocial functioning in people after traumatic brain injury.

### Design:

Cochrane systematic review update.

### Methods:

Ten electronic databases and one clinical trial registry were last searched in March 2016. Two authors independently screened the search output, extracted data and assessed quality. Mean difference (MD) and 95%CI were calculated for continuous data. Data were pooled when there were sufficient homogeneous studies.

### Results:

Eight randomised controlled trials, incorporating 399 participants, were included. The participants were primarily males in their mid-thirties with severe brain injuries. No studies included children. Studies were clinically diverse in interventions and time post-injury. At the end of intervention, the mean difference in peak power output was in favour of fitness training (MD35.5 watts, 95%CI 2.5 to 68.4 watts; 3 studies, 67 participants; low quality evidence). Post-hoc analysis for Depression including only sub-acute and chronic participants (3 studies; 178 participants, low quality evidence) showed a moderate effect of fitness training on depression (standardised MD = -0.61; 95%CI -1.1 to -0.11). No adverse events were reported.

### Conclusions/Key Practice Points:

- There is low quality evidence that fitness training is effective at improving cardiorespiratory fitness.
- There is insufficient evidence to draw any definitive conclusions about secondary outcomes.
- Whilst fitness training appears to be a safe intervention for people with traumatic brain injury, more well-designed studies are required to determine a more precise estimate of the effect on fitness as well as the effects on secondary outcomes and in children.

## OPTIMAL DURATION OF PHYSICAL ACTIVITY MONITORING IN STROKE

**Fini N**<sup>1,2,3</sup>, Burge A<sup>1,2</sup>, Bernhardt J<sup>2,4</sup>, Holland A<sup>1,2</sup>

<sup>1</sup>Physiotherapy Department, Alfred Health, Melbourne, Australia, <sup>2</sup>Physiotherapy Department, School of Allied Health, La Trobe University, Bundoora, Australia, <sup>3</sup>Physiotherapy Department, Melbourne School of Health Sciences, The University of Melbourne, Melbourne, Australia, <sup>4</sup>Stroke Division, Florey Institute of Neurosciences and Mental Health, The University of Melbourne, Melbourne, Australia

NNG3A, Meeting Room C4.7, October 19, 2017, 1:15 PM - 2:00 PM

### Background:

The optimal protocol for objective measurement of physical activity is not well defined. The aim of this study was to determine the optimal duration of physical activity monitoring following stroke.

### Design:

Single centre, prospective observational study.

### Method:

Physical activity was monitored for five days ( $\geq 10$  hours wear per day) in 70 people following stroke using the Sensewear armband. Variance between two, three, four and five days of measurements for physical activity variables was examined using intra-class correlation co-efficients (ICCs). The minimum number of days to

achieve acceptable reliability (ICC  $\geq 0.8$ ) was calculated. Differences between weekend and week days were investigated using paired t-tests and Wilcoxon Signed-Ranks tests.

#### Results:

Two days of measurement were sufficient to achieve an ICC  $> 0.8$  for energy expenditure, steps per day and time spent sedentary ( $\leq 1.5$  METS), in light (1.5-3 METS) and moderate to vigorous ( $\geq 3$  METS) physical activity. At least three days were required to achieve ICC  $\geq 0.8$  when investigating the number of and time spent in bouts ( $\geq 10$  minutes) of moderate to vigorous physical activity and sedentary behaviour. Participants took significantly more steps ( $p = 0.03$ ) and spent more time in light physical activity ( $p = 0.03$ ) on weekdays than weekends.

#### Conclusion:

Following stroke, two days of measurement appears sufficient to represent habitual physical activity for most variables. Three or more days may be necessary for accurate estimates of activity bouts and sedentary behaviour. Steps per day and light physical activity are higher on weekdays than weekend days.

### SHOPPING CENTRES – SO MUCH MORE THAN SOMEWHERE TO SHOP AFTER STROKE!

**Kuys S<sup>1</sup>**, Mahendran N<sup>2</sup>, Brauer S<sup>3</sup>

<sup>1</sup>Australian Catholic University, Banyo, Australia, <sup>2</sup>University of Canberra, Canberra, Australia, <sup>3</sup>The University of Queensland, St Lucia, Brisbane, Australia

NNG3A, Meeting Room C4.7, October 19, 2017, 1:15 PM - 2:00 PM

#### Aims:

Getting back into the community is important for stroke survivors but challenges are common. This study aimed to explore the barriers and facilitators to the reintegration of stroke survivors back into their community.

#### Design:

Qualitative focus groups

#### Methods:

Five focus groups were conducted with 18 stroke survivors (mean age 70 years SD14, 78% male, 11 months SD5 post-stroke) discharged from hospital and purposively sampled to ensure diversity in age, disability level, and gender. Probe questions explored their perceptions of barriers and facilitators to community ambulation. Focus groups were facilitated by an independent physiotherapist, audio recorded and transcribed verbatim. Data from focus groups were thematically analysed with themes and subthemes were summarised.

#### Results:

Shopping centres emerged as a central theme throughout all focus groups. Stroke survivors frequented shopping centres for reasons other than doing their shopping. Reasons such as the need to get out of the house, somewhere to go rather than staying at home, and for preventing boredom. Shopping centres are accessible, have available parking, and generally have flat walking surfaces. Stroke survivors also commented on difficulties associated with accessing new shopping centres which were becoming larger, with limited or low seating often without armrests as barriers to their ability to getting out and about in the community; preferring smaller and local shopping centres.

#### Conclusions/ Key Practice Points:

- Shopping centres appear to have a role to play in the successful community integration of stroke survivors.
- Councils and policy makers need to be aware as community planning is undertaken.

## **PATHWAYS TO PARTICIPATION IN PHYSICAL ACTIVITY FOR YOUNG PEOPLE WITH DISABILITY**

**Shields N<sup>1</sup>**

<sup>1</sup>*La Trobe University, Melbourne, Australia*

NPG3, Meeting Room C4.1, October 19, 2017, 1:15 PM - 2:00 PM

Participation is defined by the World Health Organization's International Classification of Functioning, Disability and Health for Children and Youth as 'involvement in a life situation'. It has been suggested as the 'ultimate' health outcome. A recent, significant advance in paediatric disability research has been the development a conceptual framework- the Family of Participation-Related Constructs- which seeks to better define and operationalise the construct of participation. This framework reflects participation as both a process and an outcome, and also describes relationships between factors that are influenced by prior participation, and that can influence future participation.

Participation in physical activity is of particular importance for the physical and social-emotional health of young people with disability. Being physically active can have a positive impact on physical, social and emotional development and it can also influence future health and life outcomes. Young people with disability are at high risk of developing secondary chronic conditions associated with having a disability that can lead to morbidity and early mortality. In addition, they are also at risk of social isolation, with many young people with disability having few friends, small social networks and continued dependence on their families.

Young people with disability participate less frequently in sport and active physical recreation than their typically developing peers. This presentation will consider the importance of the construct of participation for paediatric physiotherapists and what role we can play in promoting and facilitating participation in physical activity, exercise and sport for young people with disability.

## **TASK-SPECIFIC GROSS MOTOR SKILLS TRAINING FOR AMBULANT SCHOOL AGED CHILDREN WITH CEREBRAL PALSY: A SYSTEMATIC REVIEW**

**Toovey R<sup>1,2,3,4</sup>**, Bernie C<sup>5</sup>, Harvey A<sup>2,3,6</sup>, McGinley J<sup>1</sup>, Spittle A<sup>1,7</sup>

<sup>1</sup>*Department of Physiotherapy, University of Melbourne, Parkville, Australia*, <sup>2</sup>*Development Disability and Rehabilitation Research, Murdoch Children's Research Institute, Parkville, Australia*, <sup>3</sup>*Centre of Research Excellence in Cerebral Palsy, Parkville, Australia*, <sup>4</sup>*Victorian Paediatric Rehabilitation Service, Monash Children's Hospital, Clayton, Australia*, <sup>5</sup>*Occupational Therapy Department, Royal Children's Hospital, Melbourne, Parkville, Australia*, <sup>6</sup>*Neurodevelopment and Disability Department, Royal Children's Hospital, Parkville, Australia*, <sup>7</sup>*Victorian Infant Brain Studies, Murdoch Children's Research Institute, Parkville, Australia*

NPG3, Meeting Room C4.1, October 19, 2017, 1:15 PM - 2:00 PM

**Aim:**

To systematically evaluate the evidence for the effectiveness of task-specific gross motor training on activity and participation outcomes in ambulant children with cerebral palsy (CP).

**Design:**

Systematic Review. No systemic evaluation of task specific training (TST) for gross motor skills has been conducted in this population.

**Methods:**

Six databases were searched for studies involving; 1. Children with CP (mean age > 4 years, > 60% of the sample ambulant); 2. TST targeting gross motor skills; and 3. Activity (skill performance, gross motor function and functional skills) and/or participation-related outcomes. Quality of included studies was assessed using standardized tools for risk of bias, study design and quality of evidence across outcomes.

**Results:** Thirteen studies met inclusion criteria including eight randomised controlled trials (RCT). Risk of bias was moderate across studies. Within-group effects of TST were positive across all outcomes of interest in 11 studies. In RCTs, between-group effects were conflicting for skill performance and functional skills while no difference/negative effects were found for gross motor function. Positive between-group effects were found for participation-related outcomes (one study: Life-HABITS performance SMD = 1.19, 95% CI 0.3 to 2.07,  $p < 0.001$ ; Life-HABITS satisfaction SMD = 1.29, 95% CI 0.40 to 2.18,  $p = 0.001$ ). Quality of evidence was low-moderate overall.

Conclusions/Key practice points:

- Limited evidence for gross motor TST for improving activity and participation-related outcomes exists.
- Recommendations for use over other interventions are limited by poor methodology and heterogeneity.
- Future high quality studies are required.

## WHY DON'T PEOPLE FOLLOW INJURY MANAGEMENT GUIDELINES?

**Leaver A<sup>1</sup>**

<sup>1</sup>The University of Sydney, Sydney, Australia

OHP3, Meeting Room C4.3, October 19, 2017, 1:15 PM - 2:00 PM

Background:

Practice guidelines have been produced in the workers compensation and compulsory third party insurance schemes to assist allied health and medical practitioners with injury management. These guidelines have been produced by multidisciplinary working parties with extensive stakeholder input using an evidence based practice model and thus should represent best practice in injury management for the respective schemes. Our current research program in whiplash management has explored issues around practitioner adherence to guidelines across several studies.

Objectives:

This presentation summarises the results of several quantitative and qualitative studies of guideline adherence in whiplash management and explores how these results might apply to promotion of guidelines and new models of workplace injury management.

Results:

Collectively, our studies demonstrated good knowledge of; the presence of, and key messages contained in whiplash guidelines. Further, our audits of practitioner self-report of injury management practices and reporting of these practices demonstrated some adherence regarding whiplash classification and selection of individual treatment modalities. In other areas such as use of imaging, identification of prognostic factors, and referral for specialist peer-review adherence was poorer. Injury management practices were also in many cases internally inconsistent with key themes of the guidelines suggesting adherence in some cases is quite superficial. Our focus group studies suggested some of important themes that underpin recommendations around injury management are not well accepted by practitioners.

Key Practice Points:

- Developers of guidelines might better explain overall approaches to injury management and better challenges practices and approaches that are inconsistent with key themes.

## READY, SET, BREAK: COMBAT TRAINING INJURIES IN AUSTRALIAN ARMY PERSONNEL

**Orr R<sup>1</sup>, Pope R<sup>1</sup>, Schram B<sup>1</sup>**

<sup>1</sup>Tactical Research Unit, Bond University, Robina, Australia

OHP3, Meeting Room C4.3, October 19, 2017, 1:15 PM - 2:00 PM

Aim:

The aim of this research was to investigate combat training-related injuries in Australian Army personnel.

Design:

Retrospective cohort study.

Methods:

Injury records covering a 2-year period were extracted from a military injury reporting database. Inclusion criteria were: a) records related to personnel serving in either the Army Reserve (ARES) or Australian Regular Army (ARA) who suffered a musculoskeletal injury (minor, serious or fatal) in the period of interest; and b) the identified injury cause met specific inclusion criteria related to combat training (e.g. battle PT, obstacle course, etc). Reported injury incidence rates were calculated for ARES and ARA and compared, and

injury details were descriptively analysed. The Australian Defence (LERP 14-024) and Bond University (RO1907) Human Research Ethics Committees approved the study.

#### Results:

In total, 4004 injury records met the inclusion criteria. The overall incidence rate for reported injuries was 6.3 injuries/100 person-years of service (full-time soldier rate = 5.6 inj/100 person-years of service; reserve soldier = 15.1 injuries/100 person-years of service). The leading combat training-related activities to cause injuries were 'Combat Training' (44.06%), 'Physical Training' (17.68%) and 'Marching' (15.61%). The 'knee' was the leading site of injury (14.43%), followed by the 'ankle' (11.14%) and 'lower back' (10.09%). The leading nature of injury was 'Soft tissue injuries due to trauma or unknown mechanisms' (46.70%) followed by 'trauma to muscles' (6.67%) and 'heat stress/heat stroke' (4.90%).

#### Conclusion / Key Practice Points:

- Combat specific training must be an integral part of any soldier's return-to-work reconditioning program, especially for reserve personnel.

#### SIX-MONTH CLINICAL COURSE AND FACTORS ASSOCIATED WITH NON-RECOVERY IN MIGRAINE AND NON-MIGRAINE HEADACHES: IMPLICATIONS TO PHYSIOTHERAPY

**Aguila M<sup>1,2</sup>**, Rebbeck T<sup>1,3</sup>, Pope A<sup>4</sup>, Ng K<sup>5</sup>, Leaver A<sup>1</sup>

<sup>1</sup>The University of Sydney Faculty of Health Sciences, Lidcombe, Australia, <sup>2</sup>University of the Philippines College of Allied Medical Professions, Manila, Philippines, <sup>3</sup>John Walsh Centre of Rehabilitation Research, Kolling Institute of Medical Research Royal North Shore Hospital, University of Sydney, St Leonards, Australia, <sup>4</sup>Statistical Consulting, University of Sydney, Darlington, Australia, <sup>5</sup>Department of Neurology, Royal North Shore Hospital, University of Sydney, St Leonards, Australia

R5-3, Meeting Room C4.2, October 19, 2017, 1:15 PM - 2:00 PM

#### Aim:

To explore the six-month course and factors associated with non-recovery in disability in migraine compared with non-migraine headaches

#### Design:

Longitudinal cohort study

#### Method:

Participants (n = 37 with migraine; n = 42 with tension-type or cervicogenic headache) underwent physical examination for cervical musculoskeletal impairments at baseline. Participants completed questionnaires on pain, disability, and other self-report measures at baseline and follow-up, and an electronic headache diary for 6 months. Course of headaches was examined using mixed within-between analyses of variance and Markov chain modelling. Headache characteristics, cervical musculoskeletal impairments and self-report outcomes were evaluated as possible factors associated with non-recovery using regression analysis.

#### Results:

Headache frequency, intensity, and activity interference in migraine and non-migraine headaches were generally stable over 6 months but showed month-to-month variations. Day-to-day variation was more volatile in the migraine than the non-migraine group ( $p < .001$ ), with the highest probability of transitioning from any headache state to no headache (probability = 0.82–0.85). The odds of non-recovery in disability was nearly 6 times higher with cervical joint dysfunction [odds ratio (95% CI) = 5.58 (1.14 to 27.42)].

#### Conclusion / Key Practice Points:

- Headache characteristics varied over 6 months, without fully remitting or progressing, in individuals with migraine and non-migraine headaches.
- Day-to-day variation in headache characteristics was more volatile in migraine.
- Clinicians should include the course of headaches and factors associated with non-recovery in patient education strategies.
- Clinicians should treat cervical joint dysfunction, when present, in patients with headaches to potentially improve outcomes in disability.

## RELATIONSHIP BETWEEN FOOT POSTURE, BALANCE, CLUBHEAD SPEED AND LOW BACK PAIN IN GOLFERS

Li L<sup>1</sup>, Jones A<sup>2</sup>, **Evans K**<sup>3</sup>

<sup>1</sup>Kunming Medical University, Kunming, China, <sup>2</sup>The University of Sydney, Sydney, Australia, <sup>3</sup>Griffith University, Gold Coast, Australia

R5-3, Meeting Room C4.2, October 19, 2017, 1:15 PM - 2:00 PM

### Aim:

This study investigated the relationship between foot posture, standing balance, clubhead speed and low back pain in golfers.

### Design:

Observational study.

### Method:

49 right-handed golfers (43 males, age  $44 \pm 13$  years; handicap  $16 \pm 7$  strokes) completed a questionnaire regarding low back pain and golf playing and practice habits. Foot posture was assessed using the Foot Posture Index-6 and right/left single-leg balance was timed with eyes opened and closed. Clubhead speed was measured (X-Golf NEX, Korea) in a matched subset ( $n = 27$ ) during five swings with both driver and 6-iron. Multivariate regression determined the factors related to low back pain and receiver operating curves determined the sensitivity of significant factors.

### Results:

57% of golfers reported lower back pain. There was no significant relationship between low back pain and playing/practice habits, single leg balance scores nor with clubhead speed in the subset. Using multivariate analysis, left Foot Posture Index-6 was the only factor related to low back pain ( $p = 0.01$ ). Foot Posture Index-6 scores of  $> 5.5$  (indicating a pronated foot) were associated with risk of low back pain.

### Conclusion / Key Practice Points:

- A pronated left (or 'lead') foot was a risk factor for a history of low back pain in this group of golfers. It may be worthwhile for physiotherapists to consider lead foot posture when assessing golfers.
- Golf playing and practice habits were not associated with reports of lower back pain.
- Foot posture did not influence single leg balance performance or clubhead speed.

## A BRIEF INTERVENTION TO FACILITATE CHANGE IN ATTITUDES AND BELIEFS OF HOSPITAL CLINICIANS IN ASSESSING CHRONIC PAIN IN OLDER ADULTS

**Fisher G**<sup>2</sup>, Wang A<sup>1,2</sup>, Hall J<sup>2</sup>

<sup>1</sup>School of Physiotherapy, Australian Catholic University, North Sydney, Australia, <sup>2</sup>Physiotherapy Department, War Memorial Hospital, Waverley, Australia

R5-3, Meeting Room C4.2, October 19, 2017, 1:15 PM - 2:00 PM

### Aim:

To investigate if clinician attitudes and beliefs towards pain are altered by a brief education day. The major hypothesis was that clinician attitudes and beliefs would shift towards a more biopsychosocial approach to the assessment and treatment of chronic pain.

### Design:

A cross-sectional survey study design used two previously validated questionnaires: Pain Attitudes and Beliefs Scale (PABS) and the Patient-Practitioner Orientation Scale (PPOS), to assess attitudes and beliefs before and after a brief pain education workshop.

### Method:

Twenty allied health clinicians from a sub-acute geriatric hospital participated in a day long pain education training workshop. Online surveys containing two questionnaires were sent to participants prior to and immediately post workshop. Non-parametric paired-samples t-test analyses were conducted and significant testing set at  $p < 0.05$ .

#### Results:

A significant shift ( $p = 0.0001$ ) away from the biomedical model ( $\chi = 9.3 \pm 6.2$ ) was detected in the PABS post workshop, indicative of a change towards a more biopsychosocial attitude in assessing and treating chronic pain. Nil significant change ( $\chi = 0.61 \pm 6.1$ ) was detected in the PPOS, indicating therapist attitudes towards their relationship with their patient remained in status quo.

#### Discussion/Conclusion:

- A brief intervention was sufficient to shift specific pain-related therapist attitudes towards a more biopsychosocial model of pain assessment, and thus represents a time and cost effective method of potentially facilitating best practice pain management.
- Further replication in a larger sample and future studies are needed to understand how this change might translate into actual clinical practice.

### DRY NEEDLING FOR SUBSCAPULARIS AS A CAUSE OF SHOULDER AND ARM SYMPTOMS IN A BODY SURFER

**Gabel P<sup>1</sup>**

<sup>1</sup>Coolum Physiotherapy, Coolum Beach, Australia, <sup>2</sup>Griffith University, Gold Coast, Australia

R5-3, Meeting Room C4.2, October 19, 2017, 1:15 PM - 2:00 PM

#### Aim/s:

To convey the treatment effect of dry needling (DN) for referred pain the shoulder due to myofascial trigger points in a stabilising muscle that have occurred from repeated eccentric loading

#### Designs:

Single prospective case study in a private patient

#### Methods:

A patient with five-weeks of left shoulder pain of non-specific cause was treated. Through subjective examination, discussion of referral patterns and use of myofascial trigger-point charts, the likely symptoms cause was delayed onset muscle soreness from the subscapularis following several days of body surfing with a hand-plane. This was confirmed by active range, muscle testing and local palpation. A small twitch response occurred during treatment with DN at 3 separate points via the axilla with the arm in external rotation and hand behind-head. Adjunct treatments included massage, mobilisation, stretching to external rotation, acupuncture with systemic and local points, plus electrotherapy and home exercises for range, stretching and graded strength.

#### Results:

DN provided immediate regaining of 75% of functional range, full active range, but only minor gains in strength. Local tenderness on palpation reduced. Follow-up treatment 1-day later, then at day-4 enabled a return to full sporting activity though some minor symptoms persisted but no loss of range or function.

#### Conclusions/Key Practice Points:

- DN can provide immediate relief and confirmation of a provisional diagnosis
- Part of a total treatment approach, it can provide rapid resumption of recreational and sporting activity
- DN should be used in conjunction with a total treatment plan.

## THE PREVALENCE OF NEUROPATHIC PAIN IS HIGH IN WOMEN WITH PAIN FOLLOWING TREATMENT FOR BREAST CANCER: A SYSTEMATIC REVIEW

**Ilhan E<sup>1</sup>**, Chee E<sup>1</sup>, Hush J<sup>1</sup>, Moloney N<sup>1</sup>

<sup>1</sup>Macquarie University, Macquarie Park, Australia

R5-3, Meeting Room C4.2, October 19, 2017, 1:15 PM - 2:00 PM

### Aim:

(1) To synthesise data on the prevalence of neuropathic pain in women following breast cancer treatment; (2) To investigate whether the prevalence of neuropathic pain differed between studies using screening questionnaires and Neuropathic Pain Special Interest Group (NeuPSIG) criteria for neuropathic pain classification.

### Design:

Systematic review and meta-analysis.

### Method:

Studies published between 2001 and 2016 were found using Medline, EMBASE, Web of Science, CINAHL, and Cochrane. Studies were included if they administered a neuropathic pain screening questionnaire and/or the NeuPSIG criteria to women treated for early-stage (I-III) breast cancer. Prevalence estimates of studies using screening questionnaires were pooled.

### Results:

Thirteen studies using validated screening questionnaires (N = 3,792), and three studies using NeuPSIG criteria (N = 621) were included. Among all participants treated for early-stage breast cancer, pooled prevalence estimates ranged from 14.2% (95% CI 8.3 to 21.4) to 27.2% (95% CI 24.7 to 88.4) for studies using screening questionnaires, while studies using NeuPSIG criteria reported prevalence rates of 24.1% to 31.3%. Among those who reported pain following treatment, the pooled prevalence estimate of neuropathic pain from screening questionnaires ranged from 32.6% (95% CI 24.2 to 41.6) to 58.2% (95% CI 24.7 to 88.4), while studies using NeuPSIG criteria reported prevalence rates of 29.5% to 57.1%.

### Conclusion/Key Practice Points:

- These prevalence estimates for breast cancer populations were higher than other types of cancer.
- Routine assessment of the contribution of neuropathic mechanisms in women with pain following breast cancer treatment is critical for optimisation of pain management in this population.

## AN OBSERVATIONAL STUDY OF PROCEDURAL PAIN MANAGEMENT DURING THE TENOTOMY STAGE OF THE PONSETI TECHNIQUE IN AN OUTPATIENT SETTING

**Moss K<sup>1</sup>**, Hennessy P<sup>1</sup>, McCormick M<sup>1</sup>, Doumit M<sup>1</sup>

<sup>1</sup>Sydney Children's Hospital Network, Randwick, Australia

R5-3, Meeting Room C4.2, October 19, 2017, 1:15 PM - 2:00 PM

### Aim:

To establish the safety and tolerability of performing percutaneous elongation of the tendoachilles, part of the Ponseti method of treatment in infants with congenital talipes equinovarus, in an outpatient setting.

### Design:

Observational study

### Method:

Infants with talipes undergoing the procedure in the outpatient setting were included. Each infant received oral 25% sucrose solution before and during the procedure. Topical anaesthetic (EMLA) was applied and local anaesthetic (Xylocaine) was injected prior to the procedure. A dummy was offered and arms swaddled. At regular intervals, an observer recorded heart rate, SaO<sub>2</sub> and gave each child a rating between zero and

ten on the FLACC scale (Face, Legs, Arms, Cry and Consolability), with higher scores indicating higher pain. Casting was applied by a physiotherapist post procedure.

#### Results:

91 participants were recruited (65 male, mean age 53 days, range 19-217 days) 47 underwent bilateral and 44 underwent unilateral procedures. At baseline, median FLACC, heart rate and SaO<sub>2</sub> were 1, 159, and 97 respectively. Peak median FLACC and heart rate was 9 and 200 respectively and lowest median SaO<sub>2</sub> was 92. The average time for FLACC to return to three or less was 3.7 minutes. Average time between peak heart rate and to return to baseline or below was 5.6 minutes. The average time for SaO<sub>2</sub> to return to 95% or above was 2.6 minutes

#### Conclusion/Key Practice Points:

- This study has shown that with the use of oral sucrose, topical and local anaesthetic, tenotomy is well tolerated and can be performed safely in the outpatient setting.

### A QUASI-EXPERIMENTAL STUDY TO EVALUATE THE USE OF COMPRESSION GARMENTS TO MANAGE PRENATAL PELVIC AND LOW BACK PAIN

**Szkwarz J<sup>1</sup>**, Hing W<sup>1</sup>, Pope R<sup>1</sup>, Rathbone E<sup>1</sup>

<sup>1</sup>Bond University, Robina, Australia

R5-3, Meeting Room C4.2, October 19, 2017, 1:15 PM - 2:00 PM

#### Aim:

Are prenatal compression shorts effective in prevention and management of pain for common pregnancy ailments including vulval varicosities, pelvic and low back pain?

#### Design:

Quasi-experimental study.

#### Method:

55 women, intervention group (IG) n = 38, comparison group (CG) n = 17, in age range 23-42 years and gestational weeks 16-31 at baseline. Recruited from hospital and community-based maternity care providers. IG wore SRC Pregnancy Shorts in addition to usual care. CG received usual care alone. Primary outcome measure: Numeric Pain Rating Scale (NPRS), assessed fortnightly over 6 weeks. Body temperatures assessed daily in IG. Data Analysis: Descriptive analyses, NPRS charts by group and time-point, and multiple linear regression to assess between-group differences in NPRS change scores at 6 weeks from baseline while controlling for other baseline factors.

#### Results:

After 6 weeks, mean±SD NPRS change scores in IG and CG were significantly different at -0.4±2.2 and +2.8±2.7, respectively, F(1,35)=14.32, p=.001. Age, gestational weeks at baseline and number of previous births did not influence 6-week NPRS change scores. 883 (99.7%) of the reported daily self-assessed body temperatures while wearing garments ranged between 35.0°C and 38.0°C; two (0.3%) were reported as 39.0°C.

#### Key Practice Points:

- SRC Pregnancy Shorts are effective, thermally safe, non-pharmacological options for prevention and management of pain during pregnancy.

### PAIN AS A LIMITING FACTOR IN SIX MINUTE WALK TESTS OF PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

**Williams M<sup>1</sup>**, Lewthwaite H<sup>1</sup>, John D<sup>1</sup>, Baldock K<sup>1</sup>, Caffarella P<sup>2</sup>, Frith P<sup>1,2</sup>

<sup>1</sup>University Of South Australia, Adelaide, Australia, <sup>2</sup>Flinders University of South Australia, Adelaide, Australia

R5-3, Meeting Room C4.2, October 19, 2017, 1:15 PM - 2:00 PM

#### Aim:

To explore the impact of pain as a limiting factor in the six minute walk test (6MWT).

Design:

Pragmatic randomized controlled trial (BREVE-RCT) - sub analysis

Method:

People with COPD block randomized to eight weeks of comprehensive pulmonary rehabilitation with (A = 52) or without a cognitive behavior therapy program (B = 49) completed 6MWTs at baseline (T0) and one month (T1) after intervention. Between groups differences were assessed with random effects mixed models for both intention to treat (ITT all randomized) and per protocol (PP commenced and 6MWT not ceased/limited by pain).

Results:

101 participants (mean age  $70 \pm \text{SD } 8.5$ , 54 males, FEV1 % pred  $47.7 \pm 16.3$ ). Few 6MWTs (4.3%) were terminated due to pain (T0: A = 2, B = 1; T1: A = 2, B = 2) but 9.3% were pain limited (T0: A = 0, B = 7; T1: A = 3, B = 5). Distance walked did not differ significantly between groups at T0 or T1 (ITT [A: mean 21.2 m (SD 49.4), 95% CI 1.0 to 41.4 vs B: -4.8 m (58.6), 95% CI -28.8 to 19.2]; PP [A: mean 26.2 (49.2) 95% CI 5.2 to 48.0 vs B -2.4 (58.6) 95% CI -30.0 to 25.2]). The PP analysis revealed Group A achieved the minimum mean for important clinical differences (25 to 33 m).

Conclusion/ Key Practice Points:

- Close to 10% of walk tests were pain limited
- The presence of pain may confound interpretation of outcomes in pragmatic trials.

## SENSORIMOTOR CONSEQUENCES OF ACUTE LATERAL ANKLE SPRAIN

### Delahunt E

SPA3, Darling Harbour Theatre, October 19, 2017, 1:15 PM - 2:00 PM

Lateral ankle sprain is the most prevalent musculoskeletal injury sustained by persons who participate in both competitive sports and recreational physical activities (Fong et al, 2007). In Australia, it has been reported that up to 70% of the general population report a history of lateral ankle sprain (Hiller et al, 2012). Globally, lateral ankle sprains account for a large percentage of all musculoskeletal injury patients attending Emergency Departments.

Despite their high prevalence, lateral ankle sprains are continuously regarded as harmless injuries, the symptoms of which will resolve expediently with minimal treatment. The reality is quite different, as following an acute lateral ankle sprain, pain and swelling are commonplace, which contribute to reduced functional capacity, occupational absence and the potential for the development of chronic ankle instability (CAI). The recurrence rate of lateral ankle sprain injuries is very high, and coincides with the progression of a number of chronic sequelae including, episodes of ankle joint "giving-way", ankle joint instability and recurrent sprain (Gribble et al, 2013). These chronic sequelae are the characteristic features of CAI (Delahunt et al, 2010). Recent work from Dr Delahunt confirms that up to 40% of people will develop CAI within 1-year of sustaining their first-ever lateral ankle sprain.

In addition, findings from Dr Delahunt's work indicates that individuals with an acute lateral ankle sprain exhibit sensorimotor anomalies during postural control tasks, landing from a step/jump and walking, with anomalies persisting for up-to 1-year following injury.

Dr Delahunt will discuss the most contemporaneous research related to lateral ankle sprain and the subsequent development of CAI. He will place specific focus on the development of sensorimotor impairments and present ideas around the implementation of appropriate management strategies.

## POSTERIOR ANKLE IMPINGEMENT SYNDROME

**Mayes S<sup>1</sup>**

<sup>1</sup>*Australian Ballet, Melbourne, Australia*

SPA3, Darling Harbour Theatre, October 19, 2017, 1:15 PM - 2:00 PM

Posterior ankle impingement syndrome (PAIS) is the most common injury sustained by professional ballet dancers and is common in sports that excessively load the posterior ankle in full plantarflexion. Repetitive loading of the posterior ankle results in compression and shearing of the ankle and subtalar joints. The presence of an os trigonum does not always correspond to symptoms, as soft-tissue impingement is often the source of pain. Misdiagnosis may occur as PAIS can present similarly to Achilles tendinopathy. Subtalar joint dysfunction is often an underlying source of posterior ankle pain and needs to be addressed. With early modification of activity, manual treatments and rehabilitation, it is uncommon that dancers in The Australian Ballet have required extended periods of time off. In protracted cases, cortisone injection followed by a graduated return to full capacity has been successful. Surgery has rarely been necessary. This presentation will address the key clinical considerations for managing PAIS.

## ANTICIPATORY POSTURAL CONTROL DIFFERENCES BETWEEN LOW BACK PAIN AND PELVIC GIRDLE PAIN PATIENTS

Bussey M<sup>1</sup>, **Aldabe D<sup>1</sup>**, Shemmell J<sup>1</sup>

<sup>1</sup>*University of Otago, Otago, New Zealand*

WMPH3, Meeting Room C4.10, October 19, 2017, 1:15 PM - 2:00 PM

Aim:

To investigate postural control differences between low back pain and pelvic girdle pain patients.

Design:

Cross-sectional case-control study.

Method:

Seventy-eight subjects (19 with posterior pelvic pain, 20 with low back pain and 39 controls) participated. Anticipatory postural actions (APA) were assessed during single leg lifts performed as fast as possible with eyes open and closed. Centre of pressure (COP) displacement, APA duration and timing were evaluated. The magnitude and timing of activity in five muscles (Biceps Femoris [BF], External Oblique [EO], Lumbar multifidus [MF], transverse abdominis/internal oblique [IO] and Gluteus Maximus [GM]) was assessed bilaterally using surface electromyography.

Results:

Significant group effects were evident for all variables apart from APA timing. The Control group demonstrated longer APAs than both Pain groups, with larger CoP displacements and velocities. Compared to other groups, people with PGP also showed longer muscle onset latency in the BF, EO MF with eyes closed and in the IO with eyes open. The PGP group also produced less muscle activity during the weight shift period particularly in the IO and MF muscles and the left BF. Interestingly, people with PGP showed smaller COP displacement when their eyes were open compared to eyes closed.

Key Practice Points:

- Our findings suggest that pain may not be a causal agent for altering muscle actions during APAs.
- The muscle delays specific to the PGP group suggest increased instability of the lumbopelvic complex in this population.
- The effect of visual occlusion implies that the PGP group may compensate for instability through sensory re-weighting.

## PELVIC GIRDLE PAIN: THE INFLUENCE OF PAIN AND OTHER FACTORS ON MOTOR FUNCTION

**Beales D<sup>1</sup>**

<sup>1</sup>*Curtin University, Perth, Australia*

WMPH3, Meeting Room C4.10, October 19, 2017, 1:15 PM - 2:00 PM

### Outline:

Physiotherapists provide front-line conservative management for individuals with pelvic girdle pain. Usually this will involve both the management of pain, and the management of motor function, with the goal of restoring mobility and physical capacity.

As such, physiotherapists need to understand how pain and motor function relate to one another in this population. Emerging pain science research in cohorts with pelvic girdle pain are providing new perspectives in this area. For example, pain sensitivity identified via clinical assessment is an important feature in the presentation of some women with pregnancy-related pelvic girdle pain. And laboratory tests inducing pelvic girdle pain has significant impact on motor function in normal individuals, providing insight into how pain may influence motor function in those with pelvic girdle pain.

Beyond pain and motor function as distinct issues, pelvic girdle pain is a multidimensional, biopsychosocial disorder. Factors from the psychosocial domain can have significant influence on both pain and motor function. As an example, poor sleep can be a factor in pregnancy related-pelvic girdle pain that might reasonably be linked to altered pain sensitivity. Or mood might directly influence motor outputs. Physiotherapist have generally embraced the biopsychosocial model of disability and the need to identify individual factors in their clients. The next step is understanding how these factors intersect to help refine management approaches.

### Key Practice Points:

- Participants will be provided with emerging perspectives in the relationship between pain and motor function in individuals with pelvic girdle pain, from a biopsychosocial perspective.
- Direct implications for clinical practice will be presented.

## CHRONIC MYOFASCIAL PAIN AND THE SENSITISED SEGMENT: INTEGRATING THE ADVANCEMENTS IN THE PAIN SCIENCES WITH OBJECTIVE PHYSICAL FINDINGS AND DRY NEEDLING STRATEGIES

**Shah J<sup>1</sup>**

<sup>1</sup>*Bethesda MD, Bethesda, United States*

ADN4, Meeting Room C4.6, October 19, 2017, 2:05 PM - 2:50 PM

This lecture integrates the fascinating and clinically impactful knowledge emerging from the pain sciences in order to analyze the dynamic/pivotal roles that trigger points (MTrPs), central sensitisation (CS), and objective physical findings play in the evaluation and management of myofascial pain syndrome. Participants will learn palpation skills and dry needling techniques that deactivate active (i.e., spontaneously painful) MTrPs, and desensitise affected segments, providing more permanent relief.

CS is responsible for aberrant pain perception. It lowers the activation threshold of muscle nociceptors and their central terminals, making them fire and cause pain in response to typically innocuous stimuli, like light pressure. Ongoing muscle nociception can initiate and perpetuate CS and may lead to functional and connectivity changes (via changes in gene expression, somatosensory processing, and synaptic connections) in central nervous system structures.

Spinal segmental sensitisation (SSS) is a hyperactive state of the dorsal horn caused by bombardment of nociceptive impulses. Active MTrPs are common sources of persistent nociception and sensitisation that often result in SSS and facilitation. Conversely, maladaptive changes in subcortical structures and dysfunctional descending inhibition may create somatic tissue abnormalities, and adversely impact mood, affect, and sleep. Either way, typical manifestations of the sensitised spinal segment include dermatomal allodynia/hyperalgesia, sclerotomal tenderness, and MTrPs within affected myotomes. Such clinical signs of CS result in an intensified pain experience that may spread to higher and lower spinal levels both ipsilaterally

and contralaterally in a mirror-image pattern. These objective and reproducible findings permit identification of the spinal segment(s) that should be treated.

## NEUROMUSCULAR RESPONSES TO IMMERSION AND AQUATIC EXERCISE

**Waller B<sup>1</sup>**

<sup>1</sup>*Faculty of Sport and Health Sciences, University of Jyväskylä, Finland*

AG4, Meeting Room C3.5, October 19, 2017, 2:05 PM - 2:50 PM

### Background:

Numerous systematic reviews and randomised controlled trials, have shown that aquatic therapy improves neuromuscular function, e.g., walking speed, agility and muscle strength, in both healthy adults and different patient populations. However, there is lack of understanding of the underlying effects of aquatic exercise and thus mechanisms behind these improvements, therefore the trend has been to transfer land-based exercises, exercise prescription and tasks directly into water. When comparing the effects of land-based to aquatic exercise there is rarely a result in favour of either training option and with perceived higher cost aquatic therapy is losing ground on land-based exercise modalities.

Land and aquatic exercises have been traditionally compared using either size of EMG signal, ground reactions forces and kinematic measurements, which are generally the end output of a complex supra-spinal process, involving processing information about the task, environment and the individual. There is a need for researchers and physiotherapists to requestion the perceived mechanisms behind the therapeutic effects of immersion and aquatic exercise.

### Objectives:

This presentation will present a summary of the research investigating the acute effects of aquatic exercise and immersion on the neuromuscular system with a particular focus on during and immediately after. By modulating different immersion conditions, i.e. different somatosensory input data from our own research groups suggest how the stretch reflex could be manipulated for different therapeutic effects. Research investigating how the different somatosensory input affects the sensory and motor cortex will be integrated and presented. This will help start to unravel the mechanisms behind the commonly observed differences in neuromuscular output and start a revolution and evolution in aquatic therapy.

### Key Practice Points:

- The aquatic environment provides therapists with a unique non-invasive and non-pharmaceutical treatment option that clearly has effects on both the peripheral and central nervous systems.
- This presentation introduces a new way of thinking in the utilisation of aquatic therapy and hopes to inspire new research questions.

## TRAUMATIC RUPTURE OF EQUINE HIND LIMB EXTENSOR TENDONS AND IMPLICATIONS FOR PHYSIOTHERAPY

**Steed C**

APG4, Meeting Room C3.4, October 19, 2017, 2:05 PM - 2:50 PM

A brief review of equine hind limb extensor tendon injuries and veterinary management. Traumatic severing of the extensor tendons in equine hind limbs below the hock is a fairly common injury usually from getting the leg stuck in a fence. Physiotherapy can play a large role in the management of these injuries, specifically with the use of electrotherapeutic modalities to accelerate and improve healing. Physiotherapy has been proven to assist in decreasing swelling and with scar management, both of which are relevant to these cases. A review of ultrasound and TENS in relation to this condition with considerations for their use will be presented, including the evidence base. Participants should be able to reflect on how their human physiotherapy electrotherapy skills and knowledge could be applied to this condition and feel they could offer it to equine clients in the future.

## MUSCLE CONTRACTURES: SUCCESSFUL TREATMENT APPROACHES

### **Saltis E<sup>1</sup>**

<sup>1</sup>*Animal PhysioNZ, Christchurch, New Zealand*

APG4, Meeting Room C3.4, October 19, 2017, 2:05 PM - 2:50 PM

Canine muscle contractures are challenging to treat and often end in amputation, however early and thorough treatment can yield success. The following 4 case studies describe treatment options for muscle contractures that can be immediately introduced into animal physiotherapy practice.

Case1. Immune mediated myositis with sudden onset of quadriceps contracture

Medical treatment: Botox injection to the quadriceps.

Physiotherapy (3 weeks 3x per week): ultrasound, deep tissue massage, joint mobilisations, aggressive stretching and PROM.

Outcome: Quadriceps flexibility and stifle ROM was regained and maintained.

Case 2. Quadriceps contracture in a 10-month-old pup

Traumatic hip luxation, ilial wing fractures and femoral fracture. Quadriceps contracture developed one month post surgery.

Surgical intervention: Femoral osteotomy, quadriceps contracture release and ischial-calcaneal suture placement.

Physiotherapy (initiated immediately following surgery): Sedated treatments 3x/day for 7 days - deep tissue mobilisation, PROM, stretching, ultrasound, and joint mobilisations.

Outcome: regained full stifle ROM, muscle flexibility, return to full function and mobility

Case 3. Infrapinatus and deltoid contracture

Ischemic necrosis of the infrapinatus and deltoid secondary to compartment syndrome during a difficult/prolonged spay.

Surgery: fasciotomy was performed.

Physiotherapy: laser, ultrasound, deep tissue mobilisation, electrical muscle stimulation, aggressive stretching, joint mobilisations, PROM combined with strengthening.

Outcome: Return of flexibility and ROM along with full function and mobility.

Case 4. Gracilis/semitendinosus fibrous contracture

Physiotherapy (conducted under sedation): Laser, ultrasound, deep tissue mobilisation, and stretching. Weekly for 4 weeks.

Outcome: Improved flexibility, function and quality of life.

## SUPPORTED SELF-MANAGEMENT FOR COPD

### **Singh S<sup>1</sup>**

<sup>1</sup>*University Hospitals of Leicester NHS Trust, Leicester, United Kingdom*

CRP4, Meeting Room C4.4, October 19, 2017, 2:05 PM - 2:50 PM

The ability to self-manage is recognised as an increasingly important intervention for all long term conditions. There are several definitions of self-management but one of the more recent ones was developed by international consensus as describes self-management for those with COPD as:

‘...a structured but personalised, and often multi-component, with goals of motivating, engaging, and supporting the patients to positively adapt their health behaviour(s) and develop skills to better manage their disease.

The ultimate goals of self-management are: a) optimising and preserving physical health; b) reducing symptoms and functional impairments in daily life and increasing emotional well-being, social well-being, and quality of life; and c) establishing effective alliances with healthcare professionals, family, friends, and community’ (Effing T et al ERJ 2016).

There is a growing evidence describing the value of self-management interventions, a number of reviews have investigated the impact of self-management and the important components (for example the added

value of exercise based interventions, action plans etc.). The content of self-management programmes is very mixed and offered at various stages of the disease. This session will examine the evidence for self-management and the components that appear to be the most important. There will also be consideration of how these interventions can be delivered.

## HOME-BASED REHABILITATION FOR COPD USING MINIMAL RESOURCES: AN ECONOMIC EVALUATION

**Burge A<sup>1,2,3</sup>**, Holland A<sup>1,2,3</sup>, McDonald C<sup>3,4</sup>, Abramson M<sup>5</sup>, Hill C<sup>3,6</sup>, Lee A<sup>1,3</sup>, Cox N<sup>1,3</sup>, Moore R<sup>6</sup>, Nicolson C<sup>2</sup>, Lahham A<sup>1</sup>, O'Halloran P<sup>7</sup>, Gillies R<sup>6</sup>, Mahal A<sup>8</sup>

<sup>1</sup>Physiotherapy, La Trobe University, Melbourne, Australia, <sup>2</sup>Physiotherapy, Alfred Health, Melbourne, Australia, <sup>3</sup>Institute for Breathing and Sleep, Austin Health, Melbourne, Australia, <sup>4</sup>Respiratory and Sleep Medicine, Austin Health, Melbourne, Australia, <sup>5</sup>Public Health and Preventive Medicine, Monash University, Melbourne, Australia, <sup>6</sup>Physiotherapy, Austin Health, Melbourne, Australia, <sup>7</sup>Public Health, La Trobe University, Melbourne, Australia, <sup>8</sup>Nossal Institute for Global Health, University of Melbourne, Melbourne, Australia

CRP4, Meeting Room C4.4, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To compare the costs and benefits of home and centre-based pulmonary rehabilitation during the 12 months following programme completion.

### Design:

Economic analysis from a healthcare perspective alongside a clinical randomised controlled equivalence trial.

### Method:

Randomly assigned participants with stable chronic obstructive pulmonary disease completed either home or centre-based pulmonary rehabilitation. Complete case analysis of individual-level data for participants who completed the Medical Outcome Survey Short Form 36 version 2 (SF-36) questionnaire at the end of pulmonary rehabilitation and 12 months following programme completion.

### Outcome measures:

Healthcare utilisation costs from administrative sources for the 12-month follow-up period. Preference-based classification of health status using SF-36 for calculation of quality-adjusted life years (QALYs).

### Results:

Data were available for 103 participants (65% of all participants), of whom 51 participants (30 female, mean±SD age 71±9 years, FEV1 53±19 %predicted) undertook home-based pulmonary rehabilitation and 52 participants (27 female, age 68±9 years, FEV1 50±20 %predicted) undertook a centre-based programme. Total costs were lower for the home-based group, but this was not statistically significant (mean difference - \$4825, 95%CI -\$11,240 to \$1768). The difference in QALYs was not significantly different between groups (0.020, 95%CI -0.026 to 0.065). For a cost-effectiveness threshold of \$50,000, the probability that a home-based programme was cost-effective was 80%.

### Conclusion/Key Practice Points:

- In the 12 months following pulmonary rehabilitation, healthcare provider costs and QALYs were not significantly different between home and centre-based groups.
- This cost-utility analysis supports the clinical implementation of this new model of pulmonary rehabilitation.

## USE OF THE AUGMENTED STUDIO TO FACILITATE PHYSIOTHERAPY STUDENT'S UNDERSTANDING OF DYNAMIC ANATOMY

**Kelly D<sup>1</sup>**, Hoang T<sup>2</sup>, Joukhader Z<sup>2</sup>, Reinoso M<sup>2</sup>, Clements T<sup>1</sup>, Vetere F<sup>2</sup>

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<sup>2</sup>Microsoft Research Centre for SocialNUI, The University of Melbourne, Parkville, Australia

EDU4, Meeting Room C4.11, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To assist physiotherapy students in translating anatomical knowledge to dynamic movement scenarios using augmented reality.

Ethics Approval: HREC1647429.1

### Design:

In a collaboration between Microsoft Social NUI and the Physiotherapy Department an augmented reality system called Augmented Studio was designed to teach students dynamic anatomical concepts. Augmented Studio enables visualisation and virtual annotation of the musculoskeletal system via digital projection of anatomical information on the human body as it moves.

### Method:

A pilot evaluation of an augmented reality system was conducted with first year physiotherapy students. Nine students, two teachers and one observing teacher were recruited to participate in a physiotherapy class using Augmented Studio. All participants completed a questionnaire which explored: learner experience; system and content quality; user intention and overall experience. Subsequent group discussion examined the learning and teaching experience.

### Results:

Descriptive statistics conducted on the five point Likert questionnaires showed positive response (average mean > 4.0, out of 5.0) to the majority of factors including: assist learning (mean 4.3, SD 0.48), enjoyment (mean 4.6, SD 0.52), improve understanding of anatomical structure (mean 4.6, SD 0.52), compelling content (mean 4.5, SD 0.71), and content relevance (mean 4.4, SD 0.52). Group discussion highlighted unanimous agreement of enhanced learning over traditional methods including being able to visualise movement, and see virtual annotations which were engaging and encouraged interactions between the teacher and the students.

### Conclusion/Key Practice Points:

- The Augmented Studio was successful in assisting student learning and understanding of dynamic anatomy and increasing participation and enjoyment of the learning scenario.

## MORE THAN SKIN DEEP – THE VALUE OF MASK-ED™ SIMULATION IN THE PHYSIOTHERAPY CLASSROOM: A MIXED METHODS COHORT STUDY

**Bissett B<sup>1</sup>**, Freene N<sup>1</sup>, Nahon I<sup>1</sup>, Witchalls J<sup>1</sup>, Copeman P<sup>1</sup>, Preston E<sup>1</sup>

<sup>1</sup>University of Canberra, Canberra, Australia

EDU4, Meeting Room C4.11, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

MASK-ED™ simulation is a novel classroom-based technique where expert clinicians don a high-fidelity silicone mask to play the role of 'patient'. The aim of this study was to determine physiotherapy students' perceptions of the value of MASK-ED™, particularly in preparation for clinical placement.

### Design:

A mixed methods study, collecting quantitative and qualitative data about students' perceptions of MASK-ED™ simulation.

#### Method:

MASK-ED™ simulation was implemented during classroom learning in the 2 semesters immediately prior to the students' first clinical placement. During 5 tutorials students practiced assessments and interventions with a uniquely created MASK-ED™ character, played by a researcher. The character was designed to align with the learning objectives of a cardiorespiratory physiotherapy unit. Third-year physiotherapy students completed a questionnaire, rating 8 statements from strongly disagree (0) to strongly agree (4) prior to and after completing their first hospital-based clinical placement. Students were then invited to participate in focus groups.

#### Results:

43 students (100%) completed both questionnaires, and 32 participated in four focus groups. Analysis revealed four themes: MASK-ED™ enriches the learning environment; MASK-ED™ enhances clinical performance; MASK-ED™ has more potential; MASK-ED™ has limitations. 100% of students agreed that MASK-ED™ improved their readiness to undertake clinical placement. However, students' perception of the effectiveness of MASK-ED™ reduced after clinical placement (MD -0.20 out of 4, 95% CI -0.54 to -0.04).

#### Conclusion / Key Practice Points:

- Physiotherapy students perceive MASK-ED™ simulation as helpful for learning and preparing for clinical placement.
- Physiotherapy educators may find MASK-ED™ a valuable addition to their simulation toolbox.

#### THE CONSENSUS ON EXERCISE REPORTING TEMPLATE (CERT): A REPORTING GUIDELINE FOR TRANSLATION OF EXERCISE INTO PRACTICE

**Slade S<sup>1,2</sup>**, Dionne C<sup>3</sup>, Underwood M<sup>4</sup>, Buchbinder R<sup>5</sup>

<sup>1</sup>La Trobe University, Centre for Sport and Exercise Medicine Research, Box Hill, Australia, <sup>2</sup>Monash University, Physiotherapy Department, Melbourne, Australia, <sup>3</sup>Laval University, Département de réadaptation, Quebec, Canada, <sup>4</sup>University of Warwick, Clinical Trials Unit, Coventry, United Kingdom, <sup>5</sup>Monash University, Department of Clinical Epidemiology, Melbourne, Australia

EDU4, Meeting Room C4.11, October 19, 2017, 2:05 PM - 2:50 PM

#### Background:

Exercise is effective for prevention and management of acute and chronic health conditions yet have been poorly described in clinical trial reports, leaving readers unclear about the content of effective programs.

#### Aims:

To develop a standardized method for reporting exercise programs in clinical trials, the Consensus on Exercise Reporting Template (CERT); and to provide an Explanation and Elaboration Statement for implementation guidance.

#### Design:

Delphi consensus study and EQUATOR Network methodological framework for developing reporting guidelines.

#### Methods:

We invited 137 exercise experts to participate and used three sequential rounds of anonymous online questionnaires and a workshop; finalized the reporting guideline; and developed an Explanation and Elaboration Statement.

#### Results:

There were 57, 54 and 49 respondents to Rounds 1-3 respectively from 11 countries and a range of disciplines. The final 16-item CERT provides guidance on a minimum set of key items considered essential to report replicable exercise programs. The contents may be included in online supplementary material, published as a protocol or located on websites. The Explanation and Elaboration Statement presents the rationale for each item, together with examples of good reporting.

#### Conclusions:

The CERT is an internationally endorsed guideline designed specifically for the reporting of exercise programs. It contains seven categories: materials, provider, delivery, location, dosage, tailoring, and compliance.

#### Key Practice Points:

- The CERT can be used to write reports, assess completeness of exercise descriptions and use published information.
- The CERT will facilitate implementation of effective exercise interventions into practice, reduce research waste, and improve patient outcomes.

#### FACTORS INFLUENCING RESPONSE TO ADDITIONAL PHYSICAL ACTIVITY IN OLDER PEOPLE UNDERGOING INPATIENT REHABILITATION

**Said C**<sup>1,2,3</sup>, Morris M<sup>3,4</sup>, McGineley J<sup>2</sup>, Szoeki C<sup>2</sup>, Workman B<sup>5,6</sup>, Liew D<sup>6</sup>, Hill K<sup>7</sup>, Woodward M<sup>1</sup>, Wittwer J<sup>3</sup>, Churilov L<sup>8</sup>, Bernhardt J<sup>8</sup>

<sup>1</sup>Austin Health, Heidelberg, Australia, <sup>2</sup>The University of Melbourne, Parkville, Australia, <sup>3</sup>La Trobe University, Bundoora, Australia, <sup>4</sup>Healthscope, Bundoora, Australia, <sup>5</sup>Monash Health, Cheltenham, Australia, <sup>6</sup>Monash University, Cheltenham, Australia, <sup>7</sup>Curtin University, Perth, Australia, <sup>8</sup>The Florey Institute of Neuroscience & Mental Health, Heidelberg, Australia

GPA4, Meeting Room C3.6, October 19, 2017, 2:05 PM - 2:50 PM

#### Aim:

To determine whether participant characteristics influences effect of increased physical activity on gait speed at discharge in older people receiving inpatient rehabilitation.

#### Design:

Pre-planned subanalysis of a single-blinded, multisite randomised controlled trial.

#### Method:

Older people (n = 198, median age 80.9 years, IQR 76.6- 87.2) undergoing inpatient rehabilitation to improve mobility were recruited from geriatric rehabilitation units at two hospitals. In addition to multidisciplinary usual care, participants were randomised to an intervention group, which received additional daily physiotherapy sessions focused on mobility activities, or a control group which received social activities. Self-selected gait speed at discharge was measured using a 6-metre walk test by a blinded assessor. Intention-to-treat analysis was performed using a linear regression model, with baseline gait speed as a co-variate. Pre planned subanalysis explored the impact of age, cognition, baseline mobility, primary diagnosis, comorbidities, frailty and study site on the effect of the intervention.

#### Results:

Gait speed did not differ between intervention [median 0.52 m/s (IQR 0.35 – 0.73] and control groups [median 0.59 m/s (IQR 0.41 – 0.74)] at hospital discharge (p = 0.145). There was a significant treatment interaction for cognition (p = 0.020), with outcomes favouring the control group among participants classified as cognitively impaired. No other significant interactions were noted.

#### Conclusion/Key Practice Points.

- Results must be interpreted cautiously, however cognitive status may impact on response to additional physical activity in older people receiving inpatient rehabilitation.
- Further research to explore relationships between physical activity, cognition and rehabilitation outcomes is warranted.

## THE EFFICACY AND FEASIBILITY OF AQUATIC PHYSIOTHERAPY FOR PEOPLE WITH PARKINSON'S DISEASE: A SYSTEMATIC REVIEW

**Terrens A<sup>1</sup>**, Morgan P<sup>2</sup>, Soh S<sup>3</sup>

<sup>1</sup>*Movement Disorder Program, Peninsula Health, Frankston, Australia*, <sup>2</sup>*Department of Physiotherapy, Monash University, Frankston, Australia*, <sup>3</sup>*Department of Epidemiology and Preventative Medicine, Monash University, Frankston, Australia*

GPA4, Meeting Room C3.6, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To synthesise and critically evaluate literature regarding efficacy and feasibility of aquatic physiotherapy in people with Parkinson's disease (PWP). Commonly used outcome measures and elements of aquatic interventions, with a focus on safety criteria, will be summarised.

### Design:

A systematic review with descriptive analysis of studies.

### Method:

Relevant studies were identified through searches in nine health related databases. Two independent reviewers assessed study quality using either PEDro scale or a customised tool for safety and feasibility.

### Results:

Database searches yielded 88 articles, of which 10 met pre-defined inclusion and exclusion criteria. Studies varied greatly in methodology, quality, interventions and outcome measures. Study quality was generally low (mean 6.5/10) in items requiring reporting of safety precautions, adverse events, attrition, and adherence. Outcome measures were diverse therefore a qualitative synthesis was performed. Results suggest that aquatic physiotherapy may have a positive effect on health related quality of life measured by the Parkinson's Disease Questionnaire -39 (PDQ-39) with four of five studies demonstrating a significant within group effect, and balance (Berg Balance Scale), with two of three studies demonstrating a significant within group effect.

### Conclusions/ Key practice points:

- Aquatic physiotherapy may be a beneficial treatment modality for PWP.
- A minimum data set that includes the UPDRS and the PDQ-39 may be required to aid future meta-analysis and to allow more definitive conclusions to be made regarding aquatic physiotherapy for PWP.
- PWP are a vulnerable population, where safety within an aquatic physiotherapy program needs to be well documented and addressed.

## WHAT IS THE RELATIONSHIP BETWEEN GAIT SPEED, PROSTHETIC POTENTIAL AND FUNCTIONAL INDEPENDENCE IN PEOPLE WITH LOWER LIMB AMPUTATION?

**Batten H<sup>1,2</sup>**, Mandrusiak A<sup>2</sup>, McPhail S<sup>3,4</sup>, Kuys S<sup>5</sup>

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GPA4, Meeting Room C3.6, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To determine gait speed at discharge from inpatient rehabilitation of people with a unilateral lower limb amputation (transtibial level or higher) and to investigate the relationship between gait speed, prosthetic potential and functional independence.

### Design:

Retrospective cohort study from 2005 to 2011

### Method:

One-hundred and eleven individuals were prescribed a lower limb prosthesis during inpatient rehabilitation. At discharge, measures included gait speed (Timed 10m Walk Test) and functional independence (Functional

Independence Measure motor subscale. Prosthetic potential was measured using K-level. K-level ranges from K1, which corresponds to a household ambulator and K4 to an active child, adult or athlete. Median and interquartile ranges were used to describe gait speed and functional independence for each of the four K-levels. Spearman's correlation coefficient was used to examine associations between K-level, gait speed, and functional independence.

#### Results:

Median (interquartile range) gait speed for each K-level was: K1, 0.17 (0.15-0.19)m/s; K2, 0.38 (0.25-0.54)m/s; K3, 0.63 (0.50-0.71)m/s; and K4, 1.06 (0.95-1.18)m/s. Median (interquartile range) functional independence scores for K-levels 1-4 were 82 (69-84), 83 (79-84), 85 (83-87) and 87 (86-89), respectively. Positive correlations were observed between K-level and discharge gait speed ( $\rho=0.64$ ,  $p<0.001$ ), K-level and discharge functional independence ( $\rho=0.50$ ,  $p<0.001$ ) and discharge gait speed and functional independence ( $\rho=0.36$ ,  $p<0.001$ ).

#### Conclusion/ Keep Practice Points:

- Prosthetic walkers with higher K-levels walked faster than lower K-levels.
- Gait speeds across all K-levels indicate high risk of morbidity and mortality.
- Rehabilitation programs should address factors contributing to slower prosthetic gait speed and incorporate gait speed training.

### GLUTEUS MINIMUS AND MEDIUS MUSCLE ACTIVITY DURING COMMON REHABILITATION EXERCISES IN YOUNG HEALTHY ADULTS

**Moore D<sup>1,2</sup>**, Semciw A<sup>3</sup>, Wajswelner H<sup>2</sup>, McClelland J<sup>2</sup>, Pizzari T<sup>2</sup>

<sup>1</sup>Coastal Physiotherapy, Burnie, Australia, <sup>2</sup>Latrobe University, Bundoora, Australia, <sup>3</sup>The University of Queensland, Brisbane, Australia

MPA4A, Meeting Room C4.9, October 19, 2017, 2:05 PM - 2:50 PM

#### Aim:

1. Quantify the segmental muscle activity levels during six common rehabilitation exercises 2. Do differences exist between the exercises for each segment?

#### Design:

Cross-sectional

#### Method:

Ten healthy adults (mean age (range) = 23.8 (22-26) years; females = 4) performed three trials of six repetitions for six common rehabilitation exercises (in a randomised order) timed to a metronome.

#### Outcome measures:

Fine-wire electromyography (EMG) electrodes recorded activity from the gluteus medius anterior, middle and posterior segments, and the gluteus minimus anterior and posterior segments on the stance limb during each exercise. 1) Average EMG amplitude was normalised to maximum isometric voluntary contraction (MVIC) and quantified for each muscle segment during each exercise. 2) Activity between exercises were compared with a one-way ANOVA for each segment.

#### Results:

Moderate (20-40% MVIC) to high (>40% MVIC) segmental gluteus medius activity levels were generated by all exercises except for the side-lying clam that generated low (<20% MVIC) activity levels. High mean (standard deviation) anterior gluteus minimus activity was generated by the resisted hip abduction-extension exercise (55.06 (32.64)) whilst all exercises except the side-lying clam generated high activity levels for the posterior gluteus minimus. Significant differences ( $p < .05$ ) were found for each of the segments between some exercises with large standardised mean differences.

#### Conclusion/Key Practice Points:

- The individual gluteus medius and minimus segments can be specifically targeted with rehabilitation exercises for strengthening.
- Targeted anterior gluteus minimus strengthening seems more difficult.

- Side-lying clam not recommended for targeted segmental gluteus medius or minimus strengthening.

## IDENTIFYING FEATURES ASSOCIATED WITH GREATER TROCHANTERIC PAIN SYNDROME: A SYSTEMATIC REVIEW

**Plinsinga M<sup>1</sup>**, Ross M<sup>1</sup>, Coombes B<sup>2</sup>, Vicenzino B<sup>1</sup>

<sup>1</sup>*School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, Australia*, <sup>2</sup>*School of Biomedical Sciences, The University of Queensland, Brisbane, Australia*

MPA4A, Meeting Room C4.9, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To identify differences in histological, physical and psychosocial features between individuals with greater trochanteric pain syndrome and other patient populations.

### Design:

A systematic review

### Method:

A comprehensive electronic search was undertaken for terms referring to greater trochanteric pain syndrome. Studies that provided comparison of individuals with greater trochanteric pain syndrome (clinically characterized by lateral hip pain with or without diagnostic imaging) with either healthy controls or another clinical population were included. Meta-analysis was not possible due to the wide variety of outcome measures. Data represented as standardised mean differences (95% confidence intervals) as calculated from individual studies.

### Results:

The search revealed 1330 studies, of which 13 met pre-determined selection criteria. Compared to healthy controls, large effects were found in three studies for inter ASIS width (SMD 1.40 (95%CI 0.87 to 1.92), 1.51 (0.77 to 2.25)), 1.43 (0.94 to 1.92)), greater trochanteric width in two studies (0.92 (0.24 to 1.61), 1.00 (0.71 to 1.29)), and hip abductor muscle strength of the symptomatic hip in three studies (-1.4 (-1.84 to -0.96), -2.32 (-3.16 to -1.47), -4.29 (-5.98 to -2.61)). Also, moderate to large effects (i.e., SMD >0.8) were found on external hip adduction moment during walking and stair ascent, contralateral trunk lean during stance in stair ascent, and for pelvic obliquity during maintained single leg stance.

### Conclusion/Key Practice Points:

- Features of pelvic morphology, hip abductor weakness, kinematics and kinetics seem to characterise greater trochanteric pain syndrome.
- Lack of studies of psychosocial features in chronic pain condition prompts further consideration.

## WHAT IS THE DIAGNOSTIC UTILITY OF MAGNETIC RESONANCE AND ULTRA SOUND IMAGING FOR GLUTEUS MEDIUS TENDINOSIS AND TEARS?

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MPA4A, Meeting Room C4.9, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To determine the diagnostic accuracy of magnetic resonance (MR) and ultrasound imaging (US) for gluteal tendinopathy.

### Design:

Prospective cohort study.

#### Method:

29 participants with either gluteus medius tears (n=12) or severe hip osteoarthritis (n=17) were sequentially recruited. Participants underwent blinded MR and US imaging, and appropriate hip surgery. Tendon integrity was examined during surgery. Tendon samples were histo-pathologically evaluated for tendinosis. Standardised reporting was employed.

Imaging sensitivity, specificity, positive and negative predictive values (PPV, NPV), likelihood ratios, and overall accuracy were calculated using surgery (partial and full thickness tears) or histopathology (tendinosis) as reference standards.

#### Results:

In diagnosing tendinosis MR and US demonstrated an accuracy of 56%; sensitivity of 0% to 25%; specificity of 70.6% to 87.5%; PPV of 28/6% to 40.0%; NPV of 60.1% to 66.7%; likelihood ratios that crossed 1; wide 95% CI. In diagnosing partial thickness tears, MR and US demonstrated an accuracy of 52.0% to 72.0%; sensitivity of 0% to 40%; specificity of 55.0% to 90.0%; PPV of 18.2% to 25%; NPV of 78.3% to 86.7%; likelihood ratios that crossed 1; wide 95% CI.

In diagnosing full thickness tears, MR and US demonstrated an accuracy of >80.0%; sensitivity of 0% to 50.0%; specificity >94.7%; NPV of > 80.0%; likelihood ratios that crossed 1; wide 95% CI.

#### Conclusions:

- MR and US demonstrated poor ability to differentiate between severe tendinosis and partial thickness tears, possibly due to a lack of agreed definition.
- Clinicians need to be cautious when discussing imaging findings with clients.

### THE EFFECT OF TARGETED HIP STRENGTHENING ON PAIN AND FUNCTION IN PEOPLE WITH KNEE OSTEOARTHRITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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MPA4A, Meeting Room C4.9, October 19, 2017, 2:05 PM - 2:50 PM

#### Aim:

Investigate the effect of hip strengthening on physical function tests, pain and patient reported outcomes for people with knee osteoarthritis.

#### Design:

Systematic review with meta-analysis of randomised controlled trials.

#### Method:

Studies were identified by a search of electronic databases including MEDLINE, EMBASE, Sportdiscus, Cochrane Library and Cinahl. Studies were included if they reported an RCT for the following: population- knee osteoarthritis; intervention- hip strengthening; comparison- control or alternative exercise intervention (e.g. quadriceps strengthening); outcome- pain, physical function tests, patient reported outcomes. Standardised mean differences were calculated and pooled in a meta-analysis with a random effects model. Sub-group analyses were also performed by grouping according to resistance or neuromuscular exercises.

#### Results:

11 trials were identified, with seven able to be pooled in a meta-analysis. Hip and quadriceps exercises vs quadriceps alone: significantly more effective for physical function (7 studies, -0.93[-1.50,-0.36]) but not pain (6 studies, 0.13[-0.54,-0.80]) or patient reported outcomes (5 studies, -0.48[-1.17,0.20]). Resistance exercise appears more effective than neuromuscular for improving patient reported outcomes (p=0.03).

#### Conclusion/Key Practice Points:

- The addition of hip strengthening to quadriceps strengthening can provide additional functional benefit for those with knee osteoarthritis
- Resistance exercises may be more favourable to neuromuscular exercises with patient reported outcomes.

## A PROSPECTIVE STUDY OF UPPER LIMB AND NECK FUNCTION BEFORE AND AFTER NECK DISSECTION SURGERY FOR HEAD AND NECK CANCER

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MPA4B, Meeting Room C4.8, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To measure the change in upper limb and neck function in patients with head and neck cancer undergoing neck dissection prior to, 6 months and 12 months post-surgery.

### Design:

Prospective longitudinal study.

### Method:

Fifty-five patients (80% male, median age 58 years) were recruited from medical clinics in Brisbane, Australia. Disability was measured with the Quick Disabilities of the Arm, Shoulder and Hand (QuickDASH) and the Neck Disability Index (NDI). Quality of life (QOL) was measured with the Neck Dissection Impairment Index (NDII). Neck and shoulder strength and mobility were also measured. Linear regression was used to determine differences between time points and types of neck dissection (covariates: age, sex, body mass index, radiation, chemotherapy).

### Results:

QOL reduced over time (NDII median (Q1, Q3) pre: 100 (95, 100) to 12m: 85 (60, 98);  $p < 0.001$ ). Musculoskeletal disability became apparent at the upper limb (QuickDASH pre: 0 (0, 5) to 12m: 9 (5, 30);  $p < 0.001$ ) and neck (NDI pre: 2 (0, 8) to 12m: 8 (2, 26);  $p < 0.001$ ). Bilateral surgery was significantly associated with worse QOL (coeff (95% CI) = -15 (-26, -5)) and greater upper limb disability (10 (1, 18)). Neck and shoulder mobility were below pre-morbid levels at 12 months. Males were significantly weaker ( $p < 0.05$ ) in shoulder and neck flexion following surgery.

### Conclusion:

Patients report reduced QOL and increased musculoskeletal disability, and demonstrate impaired shoulder and neck physical function, at 12 months post-neck dissection. Physiotherapy management should address these long-term musculoskeletal side-effects.

## RELATIONSHIPS BETWEEN QUALITY OF LIFE, MUSCULOSKELETAL DISABILITY, AND MUSCULAR PERFORMANCE OF THE NECK AND UPPER LIMB FOLLOWING NECK DISSECTION SURGERY

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MPA4B, Meeting Room C4.8, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To explore associations between quality of life (QOL) and musculoskeletal disability with physical measures of neck and shoulder function after neck dissection surgery for head and neck cancer.

### Design:

Cross-sectional study of patients 6m - 5y following surgery.

### Method:

Eighty-four patients (68% male, median age 61 years) from two tertiary hospitals in Brisbane, Australia, completed questionnaires to measure QOL (Neck Dissection Impairment Index), upper limb disability (Quick Disabilities of the Arm, Shoulder and Hand), and neck disability (Neck Disability Index). Physical measurements of neck and shoulder mobility and muscle strength were also collected, as were important patient-related factors (e.g. type of surgery, use of radiation or chemotherapy). Generalised linear modelling

was used to determine relationships between physical measures, treatment-related outcomes and patient-related factors, and the three primary outcomes.

#### Results:

Younger age at surgery was associated with reduced QOL (coeff (95% CI) = 0.77 (0.51, 1.02)), greater upper limb disability (-0.02 (-0.04, -0.01)) and greater neck disability (-0.03 (-0.04, -0.01)). Bilateral surgery was associated with reduced QOL (-13.55 (-23.90, -0.20)). Receiving concurrent chemoradiation after surgery was associated with reduced QOL (-19.71 (-30.57, -8.85)) and greater neck disability (0.56 (0.03, 1.10)). Shoulder flexion weakness was associated with reduced QOL (22.36 (3.57, 41.15)) and greater upper limb disability (-0.89 (-1.75, -0.04)).

#### Conclusion:

- QOL and musculoskeletal disability is associated with a range of factors, from indicators of physical impairment to patient-related factors and adjuvant treatment.
- Clinicians should consider multi-factorial contributors to musculoskeletal disorders following neck dissection for head and neck cancer.

### PROSTHETIC OUTCOME IN PEOPLE WITH LOWER LIMB AMPUTATION FOLLOWING REHABILITATION DISCHARGE: DEVELOPMENT AND VALIDATION OF CLINICAL PREDICTION RULES

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MPA4B, Meeting Room C4.8, October 19, 2017, 2:05 PM - 2:50 PM

#### Aims:

To develop and validate clinical prediction rules (CPRs) for prosthetic non-use following discharge from rehabilitation.

#### Design:

Cohort

#### Methods:

Participants were recruited from Royal Perth Hospital the state rehabilitation centre. CPRs were developed and validated using methodological and statistical standards reported in Laupacis et al<sup>1</sup>.

CPR Development: Medical records were retrospectively abstracted for potential predictor variables and 135 consecutive participants interviewed at median, 1.9 (IQR, 1.4 to 2.5) years after discharge. Time and reasons prosthetic use ceased were recorded for non-users.

CPR validation: Data were prospectively collected and 66 consecutive participants were interviewed at median, 1.3 (IQR, 1.1 to 1.4) years after discharge.

#### Results:

Amputation levels above transtibial and using a mobility aid were common predictors for CPRs derived at 4 (& 6), 8 and 12 months after discharge. Associated accuracy statistics (95% CI) for the validated CPRs were: 4 months: If 4 out of 5 variables were present (LR+ = 43.9, CI = 2.73 to 999+) probability of non-use increased from 12% to 86% (p < .0001). 8 months: If all 3 variables were present (LR+ = 33.9, CI = 2.1 to 999+) probability of non-use increased from 15% to 86% (p < .0001). 12 months: If 2 out of 3 variables were present (LR+ = 2.8, CI = 0.9 to 6.6) the probability of non-use increased from 17% to 36% (p < .031).

#### Conclusion/Key Practice Points:

- These validated CPRs have implications for rehabilitation models of care.

Acknowledgement: ISPO Australia Research Grant

## DO LOCOMOTOR TESTS USED DURING REHABILITATION IDENTIFY INCREASED RISK OF PROSTHETIC NON-USE IN PEOPLE WITH LOWER LIMB AMPUTATION?

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MPA4B, Meeting Room C4.8, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To determine if locomotor tests assessed during rehabilitation could identify people at high risk of prosthetic non-use at 12 months post-discharge.

### Design:

Retrospective cohort

### Method:

Medical records of 201 consecutive participants with lower limb amputation from Royal Perth Hospital, the state rehabilitation centre, were abstracted for 10m walk (10MWT), timed up and go (TUGT), 6 minute walk (6MWT) and four square step (FSST) tests and descriptive variables. Participants were interviewed at median 1.5 (IQR, 1.2 to 2.2) years post-discharge and classified as prosthetic users or non-users. Receiver operator characteristic curves were generated to determine performance measure thresholds and relative risk (RR) for prosthetic non-use.

### Results:

At 12 months post-discharge 18% (36) of participants were prosthetic non-users. Performance measure thresholds and RR of prosthetic non-use (95% CI) were: 10MWT: If speed was < 0.44 ms<sup>-1</sup> (Area Under the Curve (AUC) = 0.743), RR of non-use = 2.76 (CI, 1.83 to 3.79, p < .0001). 6MWT: If distance was < 191 m (AUC = 0.788), RR of non-use = 2.84 (CI, 2.05 to 3.48, p < .0001). TUGT: If time was > 21.4s (AUC = 0.796), RR of non-use = 3.17 (CI, 2.17 to 4.14, p < .0001). FSST: If time was > 36.6s (AUC = 0.762), RR of non-use = 2.76 (CI, 1.99 to 3.39, p < .0001). Only 25% of the total cohort could perform this test.

### Conclusion/Key Practice Points:

- Locomotor performance during rehabilitation may identify future risk of prosthetic non-use.
- Validation is warranted.

Acknowledgements: ISPO Australia Research Grant

## PATIENTS WITH CERVICOGENIC HEADACHE HAVE IMPAIRED PERFORMANCE OF DEEP CERVICAL EXTENSORS COMPARED WITH CONTROLS, MEASURED BY VIDEO REAL TIME ULTRASOUND.

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MPA4C, Meeting Room C3.3, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

People with cervicogenic headache (CGH) have impaired joint function and deep neck flexor muscle performance compared with controls and other headache classifications. However, impairment of deep cervical extensor (DCE) muscle performance in CEH has not been evaluated. The aim was to compare the muscle performance (change in thickness) of the DCE muscle group using video real-time ultrasound (RTUS) between people with CGH and healthy controls.

### Study Design:

Cross-sectional observational study.

### Methods:

Twelve people with CGH and 12 controls were recruited. The DCE's at the level of C2 and C4 were imaged using video RTUS whilst at rest. Participants were then asked to lift their head and video footage of the

contraction was recorded. Blinded assessors measured the change in thickness from rest to contraction, using a previously published reliable protocol.

**Results:**

People with CEH had significantly less increase in thickness of the DCE on both the symptomatic side (mean change CEH 6.8% (8.2) vs v controls 3.4% (7.2),  $p < .05$ ) and asymptomatic side (mean change CEH 5.6% (9.4) vs controls 13.4% (7.2) at the C2 level. The effects were large (eg Cohen's  $d$  symptomatic side  $-.86$  95%CI  $-1.66$  to  $-0.01$ ). Less change in thickness was correlated with increase in pain ( $p = -.44$ ).

**Conclusion/ Key Practice Points:**

- People with CEH seem to have impaired control of DCE's compared with healthy people, specific to the site of pain and correlated with pain.
- Clinicians could use this test to evaluate DCE control and to potentially use as an outcome measure to measure improved control after rehabilitation.

**A CLINICAL DECISION TOOL FOR CERVICAL ARTERIAL DISSECTION: INVESTIGATION OF CLINICAL FEATURES/RISK FACTORS IN A HEADACHE AND NECK PAIN GROUP**

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MPA4C, Meeting Room C3.3, October 19, 2017, 2:05 PM - 2:50 PM

**Aim:**

To evaluate the clinical utility of a diagnostic decision tool in people with neck pain and/or headache, and its ability to discriminate between potential cervical arterial dissection and benign causes.

**Design:**

Observational cohort study

**Method:**

Participants with neck pain and/or headache aged 18-55 years were screened using a structured interview to identify 5 key criteria (clinical features and risk factors) for cervical arterial dissection:

- acute onset new or unusual unilateral neck pain/ headache
- moderate to severe pain
- recent exposure to minor trauma/neck strain or recent infection
- unexplained dizziness or other neurological features in the last 5 weeks
- age under 55 years

Physical examination was also undertaken for vestibular, cardiovascular and neurological dysfunction.

**Results:**

Twenty participants with a mean age 27 years entered the study. The majority of participants (95%) had three or less of the 5 proposed criteria. Few had 3 or more criteria when strict definitions were applied. One participant with migraine had 4. Moderate-severe pain and exposure to trauma were common but unusual pain and neurological features were not. Most physical examination findings could be accounted for by benign causes. There was poor correlation between reported symptoms and objective signs.

**Conclusion/Key practice points:**

- Patients with neck pain and/or headache are likely to have less than 3 CAD criteria.
- Moderate to severe pain and minor trauma exposure are common
- Patients presenting with 3 or more criteria should raise suspicion of vascular involvement if benign causes cannot be found.
- Physical testing should match reported symptoms

## CORTICAL INVOLVEMENT IN NECK PAIN: THE EFFECT OF PAIN AND STIFFNESS ON IMPLICIT MOTOR IMAGERY PERFORMANCE

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MPA4C, Meeting Room C3.3, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To determine if people with neck pain and stiffness have brain-based proprioceptive dysfunction.

### Design:

Randomised, repeated measures.

### Method:

Participants that completed an online task (n=1608) were divided into the presence (acute/chronic) or absence of neck pain, and in those with neck pain, whether or not they also had neck stiffness. Implicit motor imagery tasks (left/right judgements) were completed for images of head/neck rotation and images of hands; participants identified the direction of neck rotation and hand laterality, respectively. Accuracy and response time (RT) were recorded.

### Results:

Chronic neck pain patients were less accurate for neck rotation images than pain-free controls (p=0.012), but no different from acute neck pain patients (p=0.68). People with acute neck pain were as accurate as pain-free controls (p=0.10). RT did not differ between groups (p=0.09). Impairment was specific to neck images; accuracy (p=0.38) and RT (p=0.14) did not differ between groups for hand images. In those with neck pain, having concurrent neck stiffness impaired reaction time (p=0.018), but not accuracy (p=0.32) and had no impact on performance for hand images (p=0.21-0.60).

### Conclusions:

In people with neck pain, there is specific impairment of the cortical proprioceptive maps of the neck that is heightened in those with concurrent neck stiffness. This raises the possibility that cortically targeted treatment may be of benefit in patients with neck pain and stiffness.

### Key Practice Point:

- Using left/right judgements as assessment tools may be relevant in those with neck pain (and stiffness) to identify patients with disruption to cortical proprioceptive representation.

## VALIDITY OF CLINICAL MEASURES OF SMOOTH PURSUIT EYE MOVEMENT CONTROL IN PATIENTS WITH IDIOPATHIC NECK PAIN

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MPA4C, Meeting Room C3.3, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

Electrooculography is useful in detecting smooth pursuit neck torsion (SPNT) abnormalities in patients with neck pain, however, a validated, clinically relevant measure is lacking. The aim was to explore the validity of visual assessment of formal and clinical videotaped SPNT tests by physiotherapists in comparison to electrooculography.

### Design:

Cross-sectional observational study.

### Method:

Twenty patients with idiopathic neck pain (INP) and twenty healthy controls performed the electrooculography SPNT test: first in neutral, then 45° trunk-under-head torsion to the left then right. The formal video test involved the participant following a horizontal laser stimulus simultaneous to electrooculography. The clinical video test was then performed where the participant followed the clinician's finger in the horizontal, then vertical direction. Blinded investigators interpreted and analysed the electrooculography trace and the videos.

#### Results:

Patients with INP had a significantly ( $p < 0.05$ ) greater SPNT difference than healthy controls. Visual observation of the formal test had 80% agreement with electrooculography and showed fair sensitivity (54.55%) and good specificity (89.66) whilst the clinical test had 65% agreement with electrooculography and showed poor sensitivity (27.27%) and good specificity (79.31%). Analysis of vertical SPNT proved difficult, and likely contributed to its poor sensitivity (9%).

#### Conclusions:

Visual analysis of the clinical assessment of horizontal SPNT is sufficient for detecting SPNT abnormalities in patients with INP. The accuracy of this method could be improved by including subjective reporting of symptoms to aid diagnosis and the vertical SP may require live assessment; resulting in implications for future research.

### THE EXTENT OF STRENGTH LOSS IN PARKINSON'S DISEASE: A SYSTEMATIC REVIEW

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NNG/GPA4B, Meeting Room C4.5, October 19, 2017, 2:05 PM - 2:50 PM

#### Introduction:

Loss of strength is not considered a primary impairment of Parkinson's disease (PD), but people with PD often reporting feeling weak and strength loss is associated with activity limitations. The extent of strength loss in people with PD is currently unclear. The aim of this review was to examine the extent of strength loss in people with PD.

#### Design:

Systematic review with meta-analysis of cross-sectional and case controlled studies.

#### Method:

Participants: People with idiopathic PD over 40 years of age while "on" dose compared with health age matched controls.

#### Outcomes:

Measures of strength in any muscle group.

#### Results:

Twelve studies including 443 participants met the inclusion criteria, all of which were of good methodological quality. All 12 studies were included in the meta-analysis. The pooled effect size was calculated as a standardised mean difference (SMD) because different outcome measures were used. There was a significant reduction in trunk strength (SMD - 7.72, 95% CI - 8.91 to - 5.52), lower limb strength (SMD - 0.52, 95% CI - 0.72 to - 0.31) and upper limb strength (SMD -1.36, 95% CI -2.21 to - 0.51) in people with PD compared with healthy aged matched controls.

#### Conclusion/Key Practice Points:

- There is a significant loss of strength in people with PD who are "on" dose, compared with healthy, age-matched controls.
- These findings suggest that clinicians should routinely assess the strength of people with PD, including those who respond well to levodopa medication.

## LEE SILVERMAN VOICE TREATMENT (LSVT) BIG TO IMPROVE MOTOR FUNCTION IN PEOPLE WITH PARKINSON'S DISEASE: A SYSTEMATIC REVIEW

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NNG/GPA4B, Meeting Room C4.5, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To assess the effectiveness of the intervention Lee Silverman Voice Training BIG (LSVT-BIG, signifying big movements), compared to other rehabilitation techniques, for people with Parkinson's disease (PD).

### Design:

Systematic review with meta-analysis of randomised trials.

### Method:

Medline, Embase, Cinahl, AgeLine, Scopus and the Cochrane Library were searched from inception to March 2017 using search terms related to PD and LSVT-BIG training. The LSVT-BIG intervention was defined as 16 individual sessions over four weeks, delivered by an accredited instructor, compared to any other intervention for people with PD. Outcomes related to motor function using valid and reliable outcome measures were considered. Study quality was appraised using the Cochrane Risk of Bias tool.

### Results:

Four studies were included, reporting on three randomised trials of 84 participants with mild PD. Compared to physiotherapy exercises, or a shorter training protocol, there were improvements in motor function assessed with the Unified Parkinson's Disease Rating Scale part III (mean difference (MD) -3.20, 95% CI -5.18 to -1.23) and a trend towards faster Timed Up and Go performance (MD -0.47, 95% CI -0.99 to 0.06) and 10-metre walk test (MD -0.53, 95% CI -1.07 to 0.01). Selection and attrition biases were a concern.

### Conclusion/Key Practice Points:

- Meta-analysis from a small number of trials found LSVT-BIG more effective than a shorter format or general exercises at improving motor function in people with PD.
- This provides preliminary, moderate quality evidence that amplitude oriented training is effective in reducing motor impairments for people with mild PD.

## DOPAMINE REPLACEMENT MEDICATION IMPROVES UPPER LIMB MOTOR LEARNING IN PEOPLE WITH PARKINSON'S DISEASE: A RANDOMISED CONTROLLED TRIAL

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NNG/GPA4B, Meeting Room C4.5, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To determine whether dopamine replacement medication affects learning of an upper limb feeding task in people with Parkinson's disease.

### Design:

Randomised controlled trial of an upper limb motor learning task completed "on" versus "off" levodopa medication.

### Method:

Twenty people with Parkinson's disease and intact cognition were included. Each training group performed 10 blocks of five trials of a simulated feeding task with their non-dominant arm over three consecutive days (acquisition period), followed by an initial retention and delayed retention test (two and nine days after training, respectively). The primary outcome was task performance at initial retention. Secondary outcomes included carryover in task performance between end of training and retention. Between group differences were analysed using analysis of variance.

#### Results:

Participants who trained "on" levodopa significantly improved performance each trial by 8.1 seconds (95% CI 4.5 to 11.7) at initial retention and by 10.0 seconds (95% CI 4.5 to 15.5) at delayed retention compared to those who trained "off" levodopa, controlling for baseline performance during the first acquisition block. Performance carryover between end of acquisition to either retention session (range = 21.4 seconds slower (95% CI -46.1 to 3.3) to 4.7 seconds slower (95% CI -29.3 to 20.0)) did not differ between groups.

#### Conclusion/Key Practice Points:

- People with Parkinson's disease successfully learned and retained performance of an upper limb task when training "on" levodopa medication, but were unsuccessful at learning this task "off" medication.
- Future studies should investigate the impact of fatigue on learning ability.

Trial registration: NCT02600858

### PROGRESSIVE RESISTANCE TRAINING INCREASES STRENGTH AFTER STROKE BUT THIS MAY HAVE NO EFFECT ON ACTIVITY: A SYSTEMATIC REVIEW

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NNG4A, Meeting Room C4.7, October 19, 2017, 2:05 PM - 2:50 PM

#### Aim:

To determine the effect of progressive resistance training on strength and activity after stroke.

#### Design:

Systematic review of randomised trials.

#### Method:

Trials involving adult participants of either gender at any time following stroke were included. Trials where the experimental intervention was progressive resistance training (exercising against a load that corresponds to 8-12RM at least 2 days/week and the load progressed as strength increases) were included. The primary outcome was strength measured as maximum force or torque, in muscles congruent with the muscles trained. Where multiple measures of strength were reported, the measure that best reflected the type of training (i.e., isometric or dynamic) was used. The secondary outcome was activity, measured by direct observation of performance (eg, 10-m Walk Test, Box and Block Test).

#### Results:

Eleven trials involving 314 participants were included. The overall effect of progressive resistance training on strength and activity was examined by pooling change scores from six trials with a mean PEDro score of 5.3, representing medium quality. Overall, the effect size of progressive resistance training on strength was 0.98 (95% CI 0.67 to 1.29). The overall effect size of progressive resistance training on activity was 0.42 (95%CI - 0.08 to 0.91).

#### Conclusion/Key Practice Points:

- After stroke, progressive resistance training has a large effect on strength compared with no intervention, sham intervention or a non-strengthening intervention.
- There is uncertainty about whether these large increases in strength carryover to improvements in activity.

Trial registration: CRD42015025401

## FEASIBILITY OF BALLISTIC STRENGTH TRAINING IN STROKE: A RANDOMIZED, CONTROLLED, ASSESSOR-BLINDED PILOT STUDY

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NNG4A, Meeting Room C4.7, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To establish the feasibility of ballistic strength training in stroke patients.

### Design:

A randomized, controlled, assessor-blinded study.

### Method:

Consecutively admitted inpatients following stroke were screened for eligibility. Inclusion criteria were a primary diagnosis of first ever stroke with lower limb weakness, functional ambulation category score of  $\geq 3$ , and ability to walk a minimum of 14 metres. Participants were randomized to usual care or ballistic strength training three times per week for six weeks. The primary aim was feasibility and outcomes included recruitment rate, participant retention and attrition, therapist assistance required and participant safety.

### Results:

Two hundred and eighty four patients with first ever stroke were screened between February 2014 and August 2016, and 30 (11%) participants with a mean age of 50 (SD 18) were randomized. There were no dropouts. The median number of sessions attended was 15 (range 9-17) for the ballistic training group and 17 (range 5-18) for the control group. Illness ( $n = 7$ ) and earlier than expected discharge home ( $n=4$ ) were the most common reasons for non-attendance. Sixty percent of the ballistic training exercises required hands-on assistance, compared with 34% of exercises in the control group. One participant in the control group had an extension of their stroke and one in the ballistic training group reported low back pain.

### Conclusion/Key Practice Points:

- Ballistic training is feasible in selected stroke patients, but more hands-on assistance is required than for usual care.
- Similar attendance in each group suggests that ballistic training was acceptable to patients.

## WHAT IS THE RELATIONSHIP BETWEEN LOWER BODY STRENGTH, BALANCE AND GAIT FOLLOWING STROKE?

**Mentiplay B<sup>1,2</sup>**, Williams G<sup>2,3</sup>, Tan D<sup>4</sup>, Adair B<sup>5</sup>, Pua Y<sup>4</sup>, Bower K<sup>1</sup>, Clark R<sup>1</sup>

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NNG4A, Meeting Room C4.7, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To determine which lower limb muscle group has the strongest relationship with gait and to examine the relationship between balance and gait velocity after stroke.

### Design:

Observational research design.

### Method:

Sixty-three adults following stroke (age: 60 years, 34 male) were recruited from two major hospitals in Australia and Singapore. Gait velocity was assessed with the fast paced 10m walk test and balance was assessed with a Nintendo Wii. The isometric strength of seven lower limb muscle groups was assessed with

hand-held dynamometry. Three-dimensional gait analysis was performed in a sub-group of participants to examine joint power generation during gait. Associations between measures were assessed with Spearman's correlations and linear regression models were used to examine relationships. To statistically compare lower limb muscle groups, a partial F-test was used.

#### Results:

The isometric strength of all seven lower limb muscle groups had a significant association with gait velocity ( $\rho = 0.43-0.72$ ,  $p < 0.05$ ). When comparing each muscle group, the ankle plantarflexors and hip flexors had the strongest relationship with gait velocity. Balance had a significant association with gait velocity ( $\rho = -0.53$ ,  $p < 0.05$ ), independent of isometric strength. Ankle plantarflexor isometric strength also had a significant association with ankle power generation during gait ( $\rho = 0.75$ ,  $p < 0.05$ ).

#### Conclusions/Key Practice Points:

- The strength of the ankle plantarflexors and hip flexors had the strongest relationship with gait.
- Future research should examine how treatment of these potentially important muscle groups impact upon gait function after stroke.

### THE RELATIONSHIP BETWEEN CHILDREN'S MOTOR PROFICIENCY AND HEALTH-RELATED FITNESS

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NPG4, Meeting Room C4.1, October 19, 2017, 2:05 PM - 2:50 PM

#### Aim:

To examine the relationship between motor proficiency and health-related fitness in children and to determine if particular combinations of motor skills have a stronger relationship with individual health-related fitness measures.

#### Design:

Prospective cohort study.

#### Methods:

Seventy-seven children (F:28, M:49) (Mean Age:  $11.19 \pm 2.74$ yr) participated. Physical measures included: Bruininks-Oseretsky-Test-of-Motor-Proficiency, 2nd Edition (BOT2), Body-Mass-Index (BMI), waist circumference (WC), blood pressure (BP), heart rate (HR), VO<sub>2</sub>peak (mL/kg/min).

#### Results:

Motor proficiency, had a strong negative predictive relationship with the health-related fitness measures of BMI ( $r^2 = 0.62$ ,  $p < 0.001$ ) and WC ( $r^2 = 0.72$ ,  $p < 0.001$ ) and a strong positive relationship with VO<sub>2</sub>peak ( $r^2 = 0.78$ ,  $p = 0.002$ ). Children with lower motor proficiency ( $\leq 25$ th percentile) had significantly larger mean WC ( $M = 13.85$ cm,  $p = 0.01$ ), heavier weight ( $M = 22.17$ kg,  $p = 0.02$ ) and higher BMI ( $M = 5.10$  kg/m<sup>2</sup>,  $p = 0.03$ ) than children with higher motor proficiency ( $\leq 75$ th percentile). Strength and Running Speed and Agility were the strongest contributors to the relationship between motor proficiency and WC, BMI and cardiorespiratory fitness (VO<sub>2</sub> peak).

#### Conclusions:

Motor proficiency, after controlling for age and gender is negatively associated with health-related measures including resting BP, weight, BMI and WC and is positively associated with VO<sub>2</sub>peak.

#### Key Practice Point:

- Motor proficiency, should be considered a focus for investigation for children with poor health-related fitness (e.g. high BMI and WC percentiles or low cardiorespiratory fitness), as gross motor incompetence could be an underlying contributing factor to a child's poor physical health.

## IMPACT OF PILATES INTERVENTION ON PAIN, FITNESS AND PARTICIPATION IN CHILDREN AND YOUTH WITH JOINT HYPERMOBILITY SYNDROME: A SYSTEMATIC REVIEW

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NPG4, Meeting Room C4.1, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To evaluate effectiveness of Pilates on pain, fitness and participation in children and youth with Joint Hypermobility Syndrome.

### Design:

Systematic review.

### Method:

Six electronic databases were searched from inception to August 2016 using the term 'Pilates'. Articles were included if published in English in a peer-reviewed journal and reporting original data for a Pilates intervention; with children or youth 0-22 years of age. Two reviewers independently screened all studies, then extracted and assessed the data. Level of evidence was classified using NHMRC criteria and quality was assessed using the PEDRO scale.

### Results:

Searches identified 1028 papers. Eleven fulfilled the inclusion criteria. Findings showed that Pilates may reduce pain (n=2, all p<0.001), improve muscle strength (n=5, p<0.017), and flexibility (n=5, p<0.012) in children with musculoskeletal pathology. Three studies were of high quality, six were of medium quality and two were of poor quality. No studies were specific to Joint Hypermobility Syndrome. Pilates content varied from group-based mat classes to individualized programs using specialized equipment. Dose and intervention frequency varied widely.

### Conclusion/Key Practice Points:

- This is the first systematic review of the effect of Pilates intervention for children and youth.
- Research is in the preliminary stages, however Pilates does appear to be able to reduce pain and improve strength and flexibility in children with musculoskeletal pathology.
- No specific studies are available for children or youth with Joint Hypermobility Syndrome
- Research is warranted to test the potential effectiveness of Pilates for children and youth with Joint Hypermobility Syndrome.

## PERFORMANCE-FOCUSSED EXERCISE INTERVENTIONS IMPROVE CAPACITY FOR GROSS MOTOR PARTICIPATION OF AMBULANT AND SEMI-AMBULANT CHILDREN WITH CEREBRAL PALSY: A SYSTEMATIC REVIEW

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NPG4, Meeting Room C4.1, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

Evaluate effectiveness of exercise interventions proposing to improve gross motor activity/ participation of ambulant/semi-ambulant children aged 5-16 years with cerebral palsy.

### Design:

Systematic review per PRISMA guidelines.

### Method:

Five databases were searched for: (cerebral palsy) AND (gross motor) AND (intervention\*, therap\*, treatment\* OR exercise\*). Included interventions were (1) active, land-based, gross motor exercise; (2) performed without specialized laboratory/ gym equipment, (3) with gross motor outcomes. Two reviewers rated level of evidence and conduct.

#### Results:

Eight interventions (32 studies) met criteria. Strong evidence supported Gross Motor Activity Training (n=6, Level II-IV), Gross Motor Activity Training with additional physiotherapy (n=2, Level II) and Gross Motor Activity Training with Progressive Resistance Exercise and additional physiotherapy (n=3, Level II). Weak evidence supported Modified Sport (n=3, Level IV-V), Non-Immersive Virtual Reality (n=10, Level II-V) and Physical Fitness Training (n=4, Level II-V). There was strong evidence against Gross Motor Activity Training with Progressive Resistance Exercise without additional physiotherapy (n=4, Level II). Studies demonstrated wide variations in dose (5-70 hours) and subjective motivation/engagement (Modified Sports- high, Virtual Reality- low). Studies lacked details of control groups, power calculations, attrition, reliability and sampling. Potential to measure change was frequently limited by assessments with ceiling effects for older/ more able children.

#### Conclusion/ Key practice points:

- Exercise interventions can improve gross motor function in ambulant/ semi-ambulant children with cerebral palsy.
- Evidence favours performance-focused over task-simulated approaches.
- Further research is required to improve evidence for emerging interventions (Physical Fitness Training, Modified Sport), investigate engagement, and measure participation outcomes.

#### POLICE INJURIES IN PROFILE

**Stierli M<sup>1</sup>**, Lyons K<sup>2</sup>, Orr R<sup>3</sup>, Pope R<sup>3</sup>

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OHP4, Meeting Room C4.2, October 19, 2017, 2:05 PM - 2:50 PM

#### Aim:

To determine the musculoskeletal profile of lower extremity injuries within a state law enforcement agency.

#### Design:

Retrospective cohort study.

#### Methods:

Data were collected by the NSW Police Force over a 7-year period (2009 - 2016). Data not meeting the specific definitions for musculoskeletal injury were excluded using a tiered system with data cleaned to ensure no incomplete entries and recoding to improve data integrity. Ethics approval was granted from Bond University (015360).

#### Results:

Of the initial 65,579 incidents, 12,452 (19%) were musculoskeletal lower limb incidents. The knee was the most commonly injured site (31.4%) with sprains/strains (42.3%) the most common nature of injury and arresting offenders (24.2%) the most common incident activity. Slips/trips/falls (37.8%) were found to be the most common cause of injury. Variations were found between gender most notably within the incident activity ( $p < .001$ ) where males had a 10.6% higher rate for resting an offender and females an 8.6% higher rate for walking/running. The mean number of hours worked prior to injury was  $6.12 \pm 3.96$ , mean shift length =  $10.34 \pm 3.52$  hours.

#### Conclusion / Key Practice Points:

- The leading sites of injuries (knees and ankles) were similar to that of other tactical populations. The tendency for injuries to occur later in a shift suggest that fatigue may play a part.
- Evidence based lower extremity injury reduction measures and return-to-work protocols may be of use in this population
- Work hardening should include specific tasks (like arresting an offender) and progress to functionality over a full shift length.

## STRUCTURAL FIREFIGHTING, THERMAL STRESS AND RETURN TO WORK

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OHP4, Meeting Room C4.2, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To investigate the impact of structural firefighting on firefighter hydration.

### Design:

Prospective Cohort Study.

### Methods:

Three separate studies, following similar structural firefighting tasks, were conducted over three years. Participants (2014 n=7, 2016 n= 7, 2017 n=22), who were qualified firefighters, conducted a 15-minute series of tasks associated with fire suppression in a specifically adapted training container whilst dressed in standard authorised PPE (mean weight 21.39±0.68 kg), and a 6.8 L Self Contained Breathing Apparatus (9.6 kg full and 8.6 kg empty). The temperatures imparted by the fire ranged from 40-51 degrees at 0.3 m above floor to 458-572 degrees at ceiling height. Measures included tympanic (2014, 2016, 2017), skin (2014) and core body temperature (2017), body weight (2014, 2016, 2017) and urine specific gravity (2014, 2016, 2017).

### Results:

On multiple occasions firefighters commenced duties in a state of dehydration. Skin temperatures while wearing personal protective equipment were significantly higher than ambient temperatures. Significant increases in tympanic and core body temperatures ( $p<.001$ ), and decreases in body weight ( $p<.01$ ) were found following suppression tasks. There were no significant changes in urine specific gravity.

### Conclusion:

Firefighters experienced notable thermal stress when conducting fire suppression tasks wearing personal protective equipment.

### Key Practice Points:

- For the rehabilitation physiotherapist an understanding of the workplace demands assists when developing rehabilitation routines and programs required to return firefighters to operational status.

## DON'T WEIGH ME DOWN – OCCUPATIONAL LOAD CARRIAGE IN TACTICAL ENVIRONMENTS

**Orr R<sup>1</sup>**, Pope R<sup>1</sup>

<sup>1</sup>Tactical Research Unit, Bond University, Robina, Australia

OHP4, Meeting Room C4.2, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To profile occupational loads carried by tactical personnel.

### Design:

A composite of four cross-sectional studies.

### Methods:

Data from four studies within tactical populations, being Australian Army soldiers, general and specialist police units and firefighters, were collated and synthesised. Data for soldiers were collected via detailed survey while the remaining three studies had participants weighed both with and without occupational loads.

### Results:

Australian Army soldiers (n=171) reported carrying loads of  $47.7 \pm 21.0$  kg, representing  $56 \pm 26\%$  of body weight, on combat operations. General police officers (n=98) were found to wear loads of around  $10.0 \pm 1.9$  kg, representing  $12 \pm 3\%$  body weight, with specialist officers (n=6) carrying loads of  $22.8 \pm 1.8$  kg or  $20.5\%$  ( $19.7\text{--}23.6\%$ ) body weight. Firefighters (n=15) carried loads of  $21.21 \pm 3.97$  kg or  $23 \pm 5\%$  body weight plus tool and hose loads. While all three populations carried the majority of these external loads on their trunk, there were notable differences in load placement around the body.

Conclusion:

Tactical personnel are required to carry external loads while performing their daily occupational tasks with these loads known to cause injuries and increase the risk of slips, trips and falls. Once a load carriage injury has occurred soldiers are more likely to suffer further injuries whilst performing load carriage tasks.

Key Practice Points:

Load carriage conditioning is a vital component of return to work reconditioning for tactical personnel. Failing to include this specific conditioning can increase the risk of future injuries and potentially endanger life.

## PREVENTING TACTICAL TRAINING INJURIES: PROGRESS & THE FUTURE

**Pope R<sup>1</sup>**, Orr R<sup>1</sup>

<sup>1</sup>*Tactical Research Unit, Bond University, Robina, Australia*

OHP4, Meeting Room C4.2, October 19, 2017, 2:05 PM - 2:50 PM

Aim:

To provide a candid overview of progress in preventing tactical training injuries and critical considerations for future success.

Design:

Critical review with application to real-world settings.

Methods:

Key studies we have previously conducted were purposively selected to inform this review. Strengths and limitations of included studies were identified and key data extracted and tabulated, prior to narrative synthesis.

Results:

Evidence of success in reducing tactical training injury risks is weak and spasmodic. The aetiology of tactical injuries is multifactorial and each individual intrinsic risk factor typically explains only a small (1-5%) proportion of individual variability in injury risk. Nevertheless, the cumulative effects of these risk factors over successive training activities can be large. Extrinsic risk factors and hazards are also important. Injury reporting systems underestimate injury rates, sometimes very substantially, and often do not identify important emerging injury patterns and sources, for a range of reasons. They are ineffective in identifying injury risks for novel tactical activities and contexts and for small tactical teams, can lead to an underappreciation of injuries sustained (especially minor personal injuries) and are insufficient for measuring improvement.

Conclusion / Key Practice Points:

- All contributors to injuries must be considered.
- Risk identification by diverse experts and causal analyses are important methods of identifying risks and risk sources. Injury reporting rates, not just reported rates, must be considered.
- In the future, optimised technology may enable earlier identification of emerging risks.

## THE IMPACT OF OPEN VERSUS CLOSED ENDOTRACHEAL SUCTIONING IN THE MECHANICALLY VENTILATED PAEDIATRIC POPULATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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R5-4, Meeting Room C4.2, October 19, 2017, 2:05 PM - 2:50 PM

Aim:

To determine differences in benefits, risks and outcomes of open suction versus closed suction procedures in the mechanically ventilated paediatric population.

**Design:**

Systematic review with meta-analysis of randomised trials comparing open and closed suction procedures published from September 1996 to 2016.

**Method:**

Included articles were limited to mechanically ventilated paediatric participants less than 18 years of age and principle outcomes that measured cardiorespiratory variables, loss of lung volume and infection risk.

**Results:**

The search yielded eight trials, seven of which had participant groups that were neonates. Five had data that could be included in a meta-analysis to investigate three specific outcomes; oxygen saturation, heart rate and blood pressure. Reduction in oxygen saturation was significantly greater following open compared to closed suction procedures (Hedges' g -0.48, 95% CI -0.66 to -0.30). Reductions were greatest in participant groups with low gestational ages or birth weights. There were no significant differences between open and closed suction procedures for changes in systolic blood pressure (Hedges' g - 0.065, 95% CI -0.32 to 0.19), diastolic blood pressure (Hedges' g -0.13, 95% CI -0.39 to 0.12) and heart rate (Hedges' g - 0.29, 95% CI -0.70 to 0.12). There was insufficient data for respiratory rate, loss of lung volume and infection risk to draw conclusions.

**Conclusions/Key Practice Points:**

- There is insufficient evidence to advise the sole use of either closed or open suction procedures in the mechanically ventilated paediatric population.
- Closed suction may be more appropriate to use to prevent changes in oxygen saturation.

**AQUATIC PHYSIOTHERAPY FOR IMPROVING FUNCTIONAL GAIT IN PATIENTS POST-STROKE: A SYSTEMATIC REVIEW**

**Chua J<sup>1</sup>**

<sup>1</sup>*Graythwaite Rehabilitation Centre, Ryde Hospital, Ryde, Australia*

R5-4, Meeting Room C4.2, October 19, 2017, 2:05 PM - 2:50 PM

**Aim:**

To explore the current evidence for the use of aquatic physiotherapy in comparison to land-based therapy for improving functional gait in adult patients post-stroke.

**Design:**

Literature review

**Method:**

A systematic search was conducted on five electronic databases to identify clinical trials comparing land-based and aquatic physiotherapy interventions post-stroke. Outcomes of interest included gait speed and functional balance (2 minute walk test, 10 metre walk test, Timed Up and Go, Berg Balance Scale and Functional Ambulation Categories).

**Results:**

Seven studies met the review criteria of which six were randomised control trials. Four trials were considered to have good methodological quality with PEDro score  $\geq 6$ . Subjects ranged in age from 34-80 years, from sub-acute to chronic patients post-stroke. Interventions varied from individual to group sessions, with duration ranging from 3-5 times a week for 4-8 weeks. All studies reported improvements in outcome measures for the aquatic therapy intervention groups, however results were not always statistically significant when compared to land-based physiotherapy. Significant improvements compared to land-based physiotherapy were found in Functional Reach Test and 2 minute walk test, Functional Ambulation Categories and 10 metre walk test in four of the seven studies. Due to the large variability between interventions, patient populations and outcome measures, results cannot be combined and should be interpreted with caution. There were no adverse events reported.

Conclusion/Key Practice Points:

- Aquatic therapy leads to similar or greater improvements than land-based therapy in functional gait post-stroke.
- Further studies of higher methodological quality are required.

**FLEXED POSTURE IN PARKINSON'S DISEASE CAN BE MEASURED RELIABLY IN THE CLINIC AND IS ASSOCIATED WITH POOR BALANCE AND MOBILITY**

**Forsyth A<sup>1,2</sup>**, Paul S<sup>1</sup>, Allen N<sup>1</sup>, Sherrington C<sup>4</sup>, Fung V<sup>1,3</sup>, Canning C<sup>1</sup>

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R5-4, Meeting Room C4.2, October 19, 2017, 2:05 PM - 2:50 PM

Aim:

Establish the reliability of the C7 vertebra to wall posture measurement in people with Parkinson's disease; and explore relationships between Parkinson's disease impairments and posture, and between posture and balance and mobility.

Design:

Cross sectional study.

Method:

The truncal posture of 82 participants with Parkinson's disease was measured as the distance between vertebra C7 and a wall in standing, with two measures made a week apart. Univariate and multivariate regression analyses were performed with posture and impairments including global axial symptoms, tremor, bradykinesia, rigidity, freezing of gait, reactive stepping and executive function, as well as posture with balance and mobility measures.

Results:

The posture measure had excellent test-retest reliability (ICC3,1 0.79, 95% CI 0.60 to 0.89,  $p < 0.001$ ). Global axial symptoms (adjusted  $R^2 = 0.08$ ,  $p = 0.01$ ), increased age (adjusted  $R^2 = 0.04$ ,  $p = 0.04$ ) and worse Parkinson's disease motor symptoms (adjusted  $R^2 = 0.04$ ,  $p = 0.046$ ) were significantly associated with flexed posture although the majority of the variance remains unexplained. Flexed posture was associated with poorer performance of most balance and mobility tasks after adjustment for age, gender, disease severity and duration (adjusted  $R^2 = 0.24-0.33$ ,  $p < 0.001-0.03$ ).

Conclusion/ Key practice points: In people with Parkinson's disease:

- The C7 to wall measurement is highly reliable and clinicians should consider using this measure to monitor posture.
- Older people with more severe Parkinson's disease and greater axial symptoms are at higher risk of developing flexed posture.
- Flexed posture is associated with poor balance and mobility.

**SOMATOSENSORY STIMULATION TO IMPROVE HAND AND UPPER LIMB FUNCTION AFTER STROKE**

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R5-4, Meeting Room C4.2, October 19, 2017, 2:05 PM - 2:50 PM

Aim:

To determine the efficacy of somatosensory stimulation on upper limb motor function after stroke.

Design:

Systematic review of randomized controlled trials with meta-analysis.

#### Method:

Five electronic databases (Medline, CINAHL, Embase, PEDro and OT Seeker) were searched from their inception to October 2016. Included studies were English-language randomized controlled trials where a sensory intervention was applied below the elbow to improve upper limb motor control of adults after stroke. At least one outcome needed to measure arm function at an impairment or activity level. Study selection and quality assessment (using the PEDro scale) were independently conducted by two reviewers. Meta-analysis was completed where there was sufficient homogeneity between trials.

#### Results:

Fifteen articles were included reporting data from 14 randomized controlled trials (627 participants). According to the Grades of Recommendation, Assessment, Development and Evaluation (GRADE) approach, there was low quality evidence from four trials that sensory electrical stimulation did not improve upper limb motor function compared to placebo (SMD 0.4, 95%CI 0.07 to 0.87, I<sup>2</sup> 38%) and moderate quality evidence from three trials that it did not improve motor impairment (MD 3.45 units, 95%CI 1.47 to 8.36, I<sup>2</sup> 35%). Low quality evidence from two trials demonstrated therapist delivered sensory stimulation did not improve upper limb motor function (SMD 0.25, 95%CI 0.20 to 0.69, I<sup>2</sup> 0%) compared to usual care.

#### Conclusion/Key Practice Points:

- Current evidence suggests somatosensory stimulation is not effective in improving upper limb motor function or impairment after stroke.

#### PHYSICAL ACTIVITY PARTICIPATION AMONGST COMMUNITY DWELLING LOWER LIMB AMPUTEES

**Langford J<sup>1</sup>**, Dillon M<sup>3</sup>, Granger C<sup>1</sup>, Barr C<sup>2</sup>

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R5-4, Meeting Room C4.2, October 19, 2017, 2:05 PM - 2:50 PM

#### Aim:

To describe physical activity participation amongst individuals with lower limb amputation and compare this based on a range of factors thought to influence physical activity levels.

#### Design:

Prospective cross-sectional observational study.

#### Method:

Community-dwelling adults with lower limb amputation were convenience sampled from a major metropolitan hospital. Seventy-two participants, 65% male, mean age 53.6 (SD = 16.8) years, who were 10.7 (SD = 12.6) years post amputation (60% transtibial) completed the International Physical Activity Questionnaire. An estimation of activity in MET-minutes/week was calculated and activity levels were classified as high, moderate or low. Non-parametric comparisons of physical activity levels were conducted based on a range of factors.

#### Results:

Participants reported high- (38%), moderate- (26%) and low- (36%) physical activity levels. Australian physical activity guidelines were not met by 38% of participants. Participants most commonly undertook domestic-related activities (74%) and activities of moderate-intensity (75%). Participants with dysvascular amputations (Median = 540 MET-minutes/week) were significantly less active than participants with non-dysvascular amputations (Mdn = 2955 MET-minutes/week,  $p = 0.014$ ). Participants who lived alone (Mdn = 4959 MET-minutes/week) were significantly more active than individuals who lived with others (Mdn = 1062 MET-minutes/week,  $p = 0.027$ ). No significant differences in activity levels were identified based on amputation level, gender, prosthetic use or completion of rehabilitation.

#### Conclusion/Key Practice Points:

- Approximately a third of individuals with lower limb amputation undertook low levels of physical activity.
- Physiotherapists can play a key role in assisting individuals with lower limb amputation to increase physical activity participation.

## CLINICAL MANAGEMENT OF PATIENTS PRESENTING TO THE EMERGENCY DEPARTMENTS OF A METROPOLITAN HEALTH SERVICE WITH VERTIGO, DIZZINESS AND IMBALANCE

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R5-4, Meeting Room C4.2, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To determine the proportion of patients presenting with symptoms of dizziness, vertigo or imbalance, who were assessed and managed in accordance with published clinical practice guidelines for Benign Paroxysmal Positional Vertigo (BPPV).

### Design:

Retrospective audit of medical records at three acute hospitals within a metropolitan health service.

### Method:

Ninety-six consecutive adult (age  $\geq 18$ ) presentations to the Emergency Department (ED) with symptoms of vertigo, dizziness or imbalance were identified, with 43 excluded due to non-vestibular diagnosis. Participant medical histories were reviewed to identify clinical management received during the presentation. This was compared to recommendations of published guidelines using a custom audit tool. Proportional guideline compliance between medical and physiotherapy professionals was compared using Fisher's exact test.

### Results:

Only 30% (95% CI: 19-45%) of patients received a gold-standard diagnostic test for BPPV. Computed tomography scans were the most common assessment tool (37%, 95% CI: 25-52). Patients were often prescribed with medication (61%, 95% CI: 46-74) instead of the recommended canalith-repositioning techniques (6%, 95% CI: 2-18). Medical clinicians were more likely to assess for central neurological signs than physiotherapists ( $p < 0.001$ ), while physiotherapists were more likely to provide patient education ( $p = 0.02$ ) and refer for follow-up assessment ( $p = 0.03$ ).

### Conclusion:

Physiotherapists do not adhere to clinical guidelines when managing patients with symptoms of BPPV in the acute hospital setting, despite receiving relevant education during the entry-level education programs. Physiotherapy services should investigate novel methods for education and service delivery to address the translation gap in evidence-based management of BPPV.

## PREDICTABILITY OF 1-MINUTE SIT-TO-STAND TEST (1MSTST) TO EXERCISE ENDURANCE IN PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

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R5-4, Meeting Room C4.2, October 19, 2017, 2:05 PM - 2:50 PM

### Aim:

To examine if 1-minute sit-to-stand test (1MSTST) could be used as a quick screening tool to predict exercise endurance and change of saturation in people with chronic obstructive pulmonary disease (COPD).

### Design:

Cross-sectional study.

**Method:**

Forty-six elderly with confirmed diagnosis of COPD from GOLD II to GOLD IV (aged  $73.5 \pm 7.9$ ; mean %predicted FEV<sub>1</sub>  $48 \pm 18\%$ ) were recruited from out-patient clinic. Eligible participants were asked to perform 6-minute walk test (6MWT) and 1MSTST. Distance walked in 6MWT and number of repetitions of sit-to-stand performed in 1MSTST were recorded. Level of oxygen saturation (SpO<sub>2</sub>) and heart rate were measured before and at the end of each test. Pearson's correlation was used to examine the associations and multiple regression model was used to examine the predictability of 1MSTST to 6MWD.

**Results:**

Multiple regression model revealed that repetitions of 1MSTST and %predicted FEV<sub>1</sub> were significant predictors for 6MWD accounting for 39% of variance ( $F=13.5$ ,  $p<0.001$ ) but repetitions of 1MSTST alone was the main contributor explaining 31% of the variance. Regression equation is  $6MWD = 147 + 8.2(\text{repetitions in 1MSTST}) + 1.6(\% \text{predicted FEV}_1)$ . Fair association was found between changes in SpO<sub>2</sub> measured before and after 1MSTST and that between 6MWT ( $r=0.3$ ,  $p=0.049$ ) indicating that repetitions in 1MSTST not only predicts exercise endurance but may also reflect the potential changes in saturation after 6MWT.

**Conclusion/Key Practice Points:**

- 1MSTST is a significant predictor to exercise duration in people with COPD in terms of 6MWD and could be used as quick screening tool to find the potential changes in saturation after 6MWT.

### THE OSTEOARTHRITIS OF THE KNEE CLINICAL CARE STANDARD – STRIVING TO MINIMISE UNWARRANTED VARIATION IN CARE AND PHYSIOTHERAPY'S INTEGRAL ROLE

**Williams M**, Ackerman I, Buchbinder R, Yelland M, Carter D, Page M, Herkes R, Buchan H, MacDonald A

R5-4, Meeting Room C4.2, October 19, 2017, 2:05 PM - 2:50 PM

**Aim:**

The Australian Commission on Safety and Quality in Health Care is seeking to address variability in treatment for people with knee osteoarthritis through the development and implementation of a clinical care standard. The work draws on data suggesting that the majority of people awaiting knee joint replacement surgery have not tried key evidence-based, non-pharmacological treatment options that could delay the need for surgery. The work also highlights procedures (e.g. imaging and knee arthroscopy) that are not necessary but overused in the management of osteoarthritis.

**Design:**

Development of a clinical care standard.

**Methods:**

In 2015-16, the Commission established a working group of expert clinicians and researchers specialising in musculoskeletal conditions across primary, secondary and tertiary healthcare, and consumers with experience of osteoarthritis. The group reviewed evidence sources including international and local guidelines and systematic reviews investigating imaging, knee arthroscopy and other surgical procedures, and conservative treatment for osteoarthritis.

**Results:**

Seven quality statements and associated indicators were developed to improve implementation of recommended care including comprehensive assessment, patient education and self-management, weight loss and exercise, medicines, patient review and referral for non-arthroscopic surgery. Physiotherapists are highlighted as an important part of the multidisciplinary team. In particular, physiotherapy is integral to many of the recommendations, including exercise and weight loss to enhance symptom control, joint function and quality of life.

**Conclusion:**

Physiotherapists are key partners with primary care to implement the recommendations in the Osteoarthritis of the Knee Clinical Care Standard which aims to minimise unwarranted clinical variation and optimise patient outcomes.

**DEFINING PATIENT-REPORTED OUTCOMES IN COMMUNITY-ACQUIRED PNEUMONIA: A PILOT STUDY TO DETERMINE FEASIBILITY OF ROUTINE APPLICATION IN AN ELDERLY, MULTIMORBID POPULATION**

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R5-4, Meeting Room C4.2, October 19, 2017, 2:05 PM - 2:50 PM

**Aim:**

To evaluate the feasibility of routine application of patient-reported outcome measures (PROMs) in a representative sample of hospitalized adults with community-acquired pneumonia (CAP).

**Design:**

Investigator-initiated, prospective, pilot feasibility study.

**Method:**

All patients hospitalised under a General Internal Medical (GIM) unit at two Australian hospitals over a 10-week period, meeting a standard case-definition for CAP, were screened for eligibility. Exclusion criteria included: i) cognitive impairment, ii) acute delirium, iii) insufficient English language proficiency, and iv) impaired conscious state. A total of 44 patients were recruited to participate in assessment at admission, discharge, and via telephone at 30- and 90-days post-discharge. Three PROMs tools were selected for the pilot trial. Feasibility outcomes included: i) eligibility, recruitment, and retention rates, ii) process efficiency, and ii) measures of centrality and variance for the chosen metrics.

**Results:**

52% of patients meeting the CAP case-definition were eligible for the pilot study, of which 76% were recruited. 100% successfully completed inpatient assessments with 77% retained for participation in outcome assessment at 30-days post-discharge. The PROMs tools were completed quickly (completion time per tool: median 3 mins, IQ range 2-5) in the inpatient setting. 90-day post-discharge assessments will be completed in April 2017.

**Conclusion:**

PROMs can provide useful information to inform patient-centred care, and are efficient and simple to apply in the acute hospital setting. Routine application of PROMs should be considered for patients hospitalised with CAP, which represents one of the highest burden conditions in our health system.

## ROTATOR CUFF RELATED SHOULDER PAIN. THE (VERY) STRONG CASE FOR NON-SURGICAL MANAGEMENT.

**Lewis J<sup>1</sup>**

<sup>1</sup>*University of Limerick, Limerick, Ireland*

SPA4, Darling Harbour Theatre, October 19, 2017, 2:05 PM - 2:50 PM

Rotator cuff related shoulder pain (RCRSP) is an over-arching term that encompasses a spectrum of shoulder conditions that include; subacromial pain (impingement) syndrome, bursitis, rotator cuff tendinopathy, and symptomatic partial and full thickness rotator cuff tears. For those diagnosed with RCRSP one aim of treatment is to achieve symptom free shoulder movement and function. Findings from high quality peer-reviewed research investigations suggest that a graduated and well-constructed exercise approach confers at least equivalent benefit as that derived from surgery for; subacromial pain (impingement) syndrome, rotator cuff tendinopathy, partial thickness rotator cuff (RC) tears and atraumatic full thickness rotator cuff tears. These findings are important for people experiencing rotator cuff related shoulder pain, clinicians, and health funding bodies, as considerable healthcare savings could be achieved if surgery was only considered for those not obtaining satisfactory benefit from non-surgical intervention. However, many people diagnosed with RCRSP may feel that surgery is the only option if clinicians use harmful words in their explanations to patients, such as: 'your acromion must be removed as it is impinging on your tendon', 'your symptoms are coming from your tear', 'if we don't repair your tear it will become irreparable', etc. These explanations are clearly inappropriate as research has suggested that reduction in pain and improvement in function for those diagnosed with impingement, and partial and full thickness rotator cuff tears does not depend upon the 'success' of the surgical intervention. It is possible that perceived benefit may be due to a placebo effect and possibly the enforced relative rest and graduated rehabilitation imposed by the surgical intervention. In addition there appears to be a stronger relationship between psychosocial factors and outcome than many physical factors for both surgical and non-surgical interventions.

Considerable deficits in our understanding of RCRSP persist. These include; (i) cause and source of symptoms, (ii) establishing a definitive diagnosis, (iii) establishing the epidemiology of symptomatic RCRSP, (iv) knowing which tissues or systems to target intervention, and (v) which interventions are most effective.

## POSTERIOR SHOULDER INSTABILITY: MISDIAGNOSED, MISUNDERSTOOD, AND MISTREATED

**Pizzari T<sup>1</sup>**

<sup>1</sup>*La Trobe University, Melbourne, Australia*

SPA4, Darling Harbour Theatre, October 19, 2017, 2:05 PM - 2:50 PM

Posterior shoulder instability is recognised as being less prevalent than anterior instability, however the incidence is likely underestimated since the diagnosis of this pathology is easily missed. In many cases, the patient can be diagnosed on the opposite end of the spectrum with a posterior cuff tightness. There has been limited research into the incidence, diagnosis and conservative management of posterior instability, in particular for atraumatic instability. This presentation will highlight the key features of atraumatic posterior instability, useful assessment procedures and provide an evidence and pathological-based approach to rehabilitation. The journey from clinical wisdom, to literature review, to assessment and program development and testing will be detailed. Physiotherapists involved in the rehabilitation of shoulder conditions will benefit from understanding the pathology and what to look for in their patients and having some clear direction for conservative management.

### Key Practice Points

- The key features of posterior instability will be clearly described to assist clinicians with the recognition this condition in patients.
- Assessment procedures will be highlighted and this knowledge will be useful for clinical practice.
- The rehabilitation parameters will be outlined, allowing immediate application in the clinical setting.

## MULTIPLE PREGNANCY: DOES IT OR SHOULD IT CHANGE OUR PHYSIOTHERAPY PRACTICE?

**O'Connor S<sup>1,2,3</sup>**, McPherson K<sup>4</sup>, Cooper A<sup>3,5</sup>, O'Dwyer C<sup>6</sup>, Sutherland A<sup>1</sup>

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WMPH4, Meeting Room C4.10, October 19, 2017, 2:05 PM - 2:50 PM

### Background:

Multiple pregnancies, where more than one foetus shares the womb concurrently, are higher risk than singleton pregnancies due to the unique complications that can occur, and the increased incidence of other serious complications, such as pre-term labour & birth, and pre-eclampsia. Despite representing only 1.5% of all births in Australia, multiple pregnancies utilise significantly more health care resources, and may be more likely to be prescribed costly interventions such as antenatal bed rest.

Physiotherapists are commonly involved in the care of women during the childbearing year; such as providing guidance in managing common pregnancy ailments, and exercise advice & prescription.

### Aims/Objectives:

In this "how to" session, the role of physiotherapy during multiple pregnancy will be explored; questioning whether this unique subset of pregnant women require adjustments in our practice. By the end of the session participants will be able to outline the different types of 'twinning' and the key factors contributing to maternal & foetal risks in this population; discuss & apply the evidence for exercise in multiple pregnancy; and debate the role of activity restriction and/or antenatal bed rest in this population.

### Approach:

Workshop including lecture content and peer to peer interaction. Shared reflection and debate of current knowledge, experiences and factors influencing clinical decision making with this population.

### Key Practice Points:

- Understanding the unique changes and risks of multiple pregnancy allows physiotherapists to reflect on their practice, explore areas of uncertainty, and make decisions about if, when & how to adjust their practice in this population.

## BUILDING A CULTURALLY SENSITIVE AND SAFE PHYSIOTHERAPY WORKFORCE

**Morgan M**

Mini Keynote 1, Meeting Room C4.8, October 19, 2017, 3:25 PM - 4:25 PM

Report on work being done by APA as centre piece to ATSHIHC work. Description and discussion of a pilot project between APA, the Federal Government, National Aboriginal Community Controlled Health Orgs (NACCHO) and CPDANZ enable all undergraduate physiotherapy students to undertake clinical placements in (ACCHO's) in NT, WA, QLD and VIC

## CLONTARF FOOTBALL ACADEMIES

**Riley M<sup>1</sup>**

<sup>1</sup>Clontarf Foundation, Melbourne, Australia

Mini Keynote 1, Meeting Room C4.8, October 19, 2017, 3:25 PM - 4:25 PM

An example of an holistic health program, a national intergenerational healing program and a real need for physiotherapy involvement to CLOSE the GAP.

## FUTURE OF TELEHEALTH IN PHYSIOTHERAPY PRACTICE

**Smith S<sup>1</sup>, Russell T<sup>2</sup>**

<sup>1</sup>*Southern Cross University, Coffs harbour, Australia*, <sup>2</sup>*The University of Queensland, St Lucia, Australia*

Mini Keynote 2, Darling Harbour Theatre, October 19, 2017, 3:25 PM - 4:25 PM

In every country digital technology is reshaping how today society is thinks, works, learns, and develops. Rapidly advancing health, medical, information and communication technology significantly impacts the way healthcare is delivered to keep pace with health consumer expectations. Telehealth leverages the rapid progression of technology to enable the provision of the right care at the right time, irrespective of the location of the consumer.

Traditional telehealth technologies, such as real-time videoconferencing, are increasingly supported by a new breed of technologies that can derive greater benefit from telehealth sessions. Ubiquitous sensing and computing technologies, the so-called “internet-of-things” will be capable of acquiring multidimensional markers of a person’s overall state of health and wellbeing. Through big data analytics and artificial intelligence algorithms, centrally located clinicians will be able to be better informed about the progression of their remote patients and be able to maximise the efficiency of telehealth sessions.

In this session we will explore the current evidence base for the implementation and effectiveness of telehealth technology, referring in particular to cases where it has been deployed in physiotherapy, explore the advent of interactive digital technologies leveraging game design to increase motivation and engagement of patients in their exercise sessions and finally address some issues concerning workforce development and the barriers and enablers of the implementation of Telehealth.

## MAKING THE CASE - DEMONSTRATING PHYSIOTHERAPY INTERVENTIONS HAVE IMPACT AND PROVIDE VALUE-FOR-MONEY

**Haines T, de Groot J, Johnston V**

Mini Keynote 3, Meeting Room C4.1, October 19, 2017, 3:25 PM - 4:25 PM

Healthcare costs are rising, budgets are tightening, and politicians continue to call for more doctors, nurses and hospital beds. How does physiotherapy break through the noise and justify our place in the healthcare space with evidence-based arguments?

A/Prof Venerina Johnston (The University of Queensland) is a researcher and lecturer specialising in work-related injury prevention and management. Venerina will present an overview of the burden of disease from the perspectives of the individual and society, covering quality of life and workability to healthcare service and employer costs. Outcome measures of interest to different stakeholders from the perspective of Occupational Health Physiotherapy will be presented, and examples will include how physiotherapy intervention in the workplace can impact on the individual and employer.

Prof Terry Haines (Monash University) is an NHMRC Career Development Fellow with expertise in health economics and decision-making. Terry will describe how an economic analysis considers both costs and consequences. Following on from this, Terry will make recommendations on how physiotherapists can use statements from economic evaluations when making arguments about whether services should be offered or not.

A/Prof Janke de Groot is the program leader for Quality and Organization of Care at NIVEL, The Netherlands. Janke will expand on the movement towards value-based healthcare, where outcomes that are relevant for patients play a key role in health service delivery. She will describe the choices being made internationally to shift from outcome measures of physical impairment to participation, and what this means for value-based healthcare policy.

## THE ELEPHANT IN THE ROOM: THE MEDICALISATION OF NORMALITY IN MUSCULOSKELETAL PRACTICE

**Hoffmann T<sup>1</sup>, Lewis J<sup>2</sup>**

*<sup>1</sup>Bond University, Australia, <sup>2</sup>University of Limerick, Limerick, Ireland, <sup>2</sup>University of Hertfordshire, Hertfordshire, United Kingdom*

Mini Keynote 4, Meeting Room C4.4, October 19, 2017, 3:25 PM - 4:25 PM

Musculoskeletal conditions are the second largest group impacting on the global burden of health. Historically, musculoskeletal practice focussed on addressing traumatic events, primarily fractures and dislocations. It has evolved and much of the focus is now centred on the management of non-traumatic presentations, most commonly associated with pain. Hypotheses to explain the pathoaetiology and management of these presentations have been presented. Many of them relate to 'abnormalities' of posture where deviations from an idealised norm is the basis for presenting symptoms. Examples include: forward head posture and its association with headaches, neck and shoulder pain; lumbopelvic postural abnormalities and low back pain; and deviations from subtalar neutral and foot pain. Other examples include assumptions that identified non-traumatic structural abnormalities (such as rotator cuff tears, acromial spurs, medial meniscal tears) and other presentations typically identified using a variety of imaging formats are the cause of symptoms, and surgery to 'restore' normal structure is required to reduce the pain and improve function. Many of the techniques to restore 'normality' have been shown to be placebo procedures and outcomes may relate to the enforced post-surgical relative rest on the tissues and the ensuing graduated rehabilitation, as well as psychosocial factors.

This presentation will highlight areas of uncertainty in current musculoskeletal practice and how perceived 'abnormality' is influencing clinician and patient decision-making and the care that is provided. Implications for the musculoskeletal community will be discussed, including strategies for collaboratively engaging with patients to make informed decisions.

## ADVANCING CAREERS- BUILDING THE FUTURE

**Nickson W, Harding P, Jennings M, Lenaghan D, Beales D**

Mini Keynote 5, Meeting Room C4.11, October 19, 2017, 3:25 PM - 4:25 PM

This dynamic session will navigate future directions and structures supporting career pathways for physiotherapists. The role of national frameworks will be explored, and the exponential growth in advanced practice explained, together with its challenges and barriers. Plans for Career Pathway implementation will be outlined, and future models of professional collaboration explained. What does the next generation Australian College of Physiotherapists look like? It's no longer the sole domain of clinical specialists.

## ARE SOME PEOPLE TOO PLASTIC? UNDERSTANDING NEUROPLASTICITY IN THE DEVELOPMENT OF CHRONIC PAIN

**Schabrun S<sup>1</sup>**

*<sup>1</sup>Brain Rehabilitation and Neuroplasticity Unit, School of Science and Health, Western Sydney University, Sydney, Australia*

Mini Keynote 6, Meeting Room C4.5, October 19, 2017, 3:25 PM - 4:25 PM

Maladaptive neuroplasticity is evident in the central nervous systems of people experiencing chronic musculoskeletal pain. This includes altered organisation of the primary sensory and motor cortex, increased cortical excitability and central sensitization. These maladaptive changes are thought to contribute to the development and maintenance of chronic pain, yet data on neuroplasticity in the transition from acute to chronic pain has been scarce. This presentation will explore new data on neuroplasticity in the essential transition period – which is precisely when some people are recovering from an acute episode of pain while others are not. In particular, this presentation will examine data that suggests the type of plasticity experienced by an individual may determine whether they recover or develop persistent pain. The idea of a neuroplasticity-based predisposition to chronic pain will be discussed, along with consideration of how this

knowledge can be incorporated into clinical practice to better identify those at risk of chronicity and to prevent and treat musculoskeletal pain.

**Key Practice Points:**

- Understand the role of neuroplasticity in the transition from acute to chronic pain
- Understand the multiple forms of neuroplasticity that exist in the human brain and how these contribute to chronicity
- Understand how individual variation in neuroplasticity may determine who recovers, and who does not, after an acute episode of pain
- Understand how this information may help identify and treat those at risk of chronic pain in clinical practice.

## THINKING OUTSIDE THE JOINT: NEW INSIGHTS FROM PAIN NEUROSCIENCE FOR OSTEOARTHRITIC PAIN

**Stanton T<sup>1,2</sup>**

<sup>1</sup>The University of South Australia, Adelaide, Australia, <sup>2</sup>Neuroscience Research Australia, Sydney, Australia

Mini Keynote 6, Meeting Room C4.5, October 19, 2017, 3:25 PM - 4:25 PM

**Outline of presentation**

Pain is an incredibly complex phenomenon. We regularly experience the disconnect between tissue damage and pain – tiny paper cuts can be surprisingly painful, and yet you can have a bruise that you don't remember getting. This disconnect extends to clinical conditions such as osteoarthritis – for example, some people with significant joint degeneration on radiographic imaging have no pain. Further, up to 15% of people have severe knee pain even after a total knee replacement. These findings clearly highlight that other factors contribute to the pain experience.

Recent experimental and clinical research has highlighted intriguing links between brain-based body representations and pain. This presentation will provide an update on new research in pain neuroscience, namely discussing the evidence for perceptual dysfunction in osteoarthritis. It will also discuss new findings on perceptual manipulation – via body illusions – and their effect on clinical osteoarthritic pain and stiffness. It will then explore other clinical ramifications of altered body perception. Last, this talk will discuss the role that treatments targeting body perception and awareness may play in physiotherapy management of osteoarthritic pain.

**Key Practice Points**

- Clinical surrogates of brain-based body representations, such as tactile discrimination thresholds, implicit motor imagery performance, and body awareness, should be considered in musculoskeletal assessments.
- Given experimental and clinical evidence that vision of the body itself can modulate pain, use of visual feedback (direct or mirrored) during movement involving the painful body part is supported for treatment.
- Bodily illusions show therapeutic promise; further work is needed to determine whether they have clinical relevance.

## UNNECESSARY CARE CROWDS OUT NECESSARY CARE, WHAT CAN WE DO ABOUT IT?

**Hoffman T, Maher C, Slater H, Maher C**

Plenary 2, Darling Harbour Theatre, October 19, 2017, 4:30 PM - 5:30 PM

There is a growing awareness that the twin problems of overdiagnosis and overtreatment pose a major threat to human health across the globe. A story in the May 11 2015 issue of the New Yorker described the problem very simply: 'An avalanche of unnecessary medical care is harming patients physically and financially'. The writer was a practising clinician and offered a wise piece of advice that we have adopted as the theme for this plenary session "It isn't enough to eliminate unnecessary care. It has to be replaced with necessary care."

In this plenary session you will hear the speaker's perspectives on reducing unnecessary care and replacing it with necessary care with a specific focus on the physiotherapy profession. What are the potential drivers,

how other professions have dealt with the problem of too much medicine and how physiotherapists have worked to develop models of care to replace unnecessary care with necessary care.

## NOVEL ULTRASOUND TECHNOLOGIES IN THE CLINIC: MEASURING EFFECTS OF DRY NEEDLING USING OBJECTIVE, QUANTITATIVE OUTCOME MEASURES.

**Shah J<sup>1</sup>**

<sup>1</sup>Bethesda MD, Bethesda, United States

ADN5, Meeting Room C4.6, October 20, 2017, 10:35 AM - 11:35 AM

Current diagnostic standards for myofascial pain rely on palpation for identification of myofascial trigger points (MTrPs) in taut bands of skeletal muscle. However, proper diagnosis requires a skilled and experienced clinician, and low inter-rater reliability among examiners identifying MTrPs is concerning. Although digital palpation is considered the gold standard for diagnosis, it does not: 1) provide an objective, reliable, and sensitive method of diagnosis and measurement of treatment efficacy; 2) provide quantitative comparisons of the tissue properties before and after treatment; 3) objectively differentiate among active MTrPs, latent MTrPs, and palpably normal tissue; 4) objectively discriminate between superficial and deep MTrPs; and 5) permit objective study of the natural history of MTrPs. Additionally, the effectiveness of dry needling (DN) has been difficult to demonstrate due to a lack of objective outcome measures of pain.

Three types of diagnostic ultrasound—grayscale (2D ultrasound), vibration sonoelastography, and Doppler—can differentiate tissue characteristics of MTrPs from surrounding soft tissue. They may be used to properly diagnose MTrPs, understand their natural progression, overcome the limitations of digital palpation, and serve as outcome measures to assess the changes that result from DN treatment. For example, after DN treatment, the size of active-MTrPs decreases on ultrasound with reduction in pain; MTrPs that do not respond to treatment remain large, and people with active-MTrPs unresponsive to treatment experience greater pain than responders. DN also changes the MTrP status (from active to latent or active to normal), decreases MTrP size, and quantifiably decreases the stiffness of the MTrP.

## EXERCISE FOR CARTILAGE REPAIR AND HEALTH: AN AQUATIC THERAPY APPROACH

**Waller B<sup>1</sup>**

<sup>1</sup>Faculty of Sport and Health Sciences, University of Jyväskylä, , Finland

AG5, Meeting Room C3.5, October 20, 2017, 10:35 AM - 11:35 AM

### Background:

Concomitant cartilage injuries are common following trauma to the knee and are associated with an increased risk of suffering from osteoarthritis, which typically presents 5-10 years after injury. The timetable and progression of the rehabilitation of knee injuries often follows the healing of the soft tissues, with accelerated protocols gaining popularity. However, the associated chondral injuries are not always considered in the treatment plan, thus possibly increasing the risk of post-traumatic osteoarthritis. Further, focus of osteoarthritis management has shifted from the treatment of the symptoms at the end stage of the disease to managing the early stage of the disease and preventing progression to a later stage of the disease and possible surgery.

### Objectives:

This presentation will discuss the post-trauma management of knee cartilage following an athletic injury to the knee as well as the early stages of osteoarthritis. Theories based on the current understanding on the mechanical loading, dose and progression of rehabilitation timetables for cartilage will be presented. In particular, published and unpublished data from our SQUAREHAB and LuRu projects will be presented and discussed.

### Key Practice Points:

- Exercises that support cartilage healing i.e. low-impact neuromuscular exercises, aerobic fitness and high-repetition full-range of motion exercises will be presented.
- Aquatic exercise is one such intervention option which has been traditionally only utilised in early stage of acute knee injuries or at the late stages of osteoarthritis.

- Specific focus will be placed on evaluating the current potential of aquatic resistance training throughout the OA continuum.

## NEUROMUSCULAR ACTIVATION OF QUADRICEPS IN SQUATS IN WATER COMPARED TO ON LAND: IMPLICATIONS FOR CLINICAL PRACTICE IN AQUATIC PHYSIOTHERAPY

**Heywood S<sup>1,2</sup>**

<sup>1</sup>University of the Sunshine Coast, Australia, <sup>2</sup>St Vincent's Hospital, Melbourne, Australia

AG5, Meeting Room C3.5, October 20, 2017, 10:35 AM - 11:35 AM

High quality evidence indicates that aquatic exercise is as effective as land-based exercise for improving pain, function and quality of life in people with knee osteoarthritis. The content of aquatic rehabilitation programs is variable and unfortunately justification for specific exercises is lacking. Furthermore, definitions of the type of exercises included in programs, whether resistance training, aerobic, flexibility, task practice or balance training, are often absent. Reduced weight-bearing due to buoyancy and depth of immersion are concepts that are often applied in aquatic physiotherapy to vary load in closed kinetic chain exercises. Application of drag force is less consistently used to progress load. Emerging evidence on the neuromuscular activity of quadriceps in squats in older adults indicates at slower speeds of movement there is less than half the muscle activity in water compared to on land. At slower speeds there is also minimal muscle activity in greater degrees of knee flexion as the trunk is lowered into the water. Faster squats leads to more than half the quadriceps muscle activity in water compared to on land. Prescribing speed with closed kinetic chain exercise in water for people with knee osteoarthritis is just as critical as considering depth of immersion to estimate or progress load.

### Key Practice Points:

- Defining prescribed exercise types will assist clinical reasoning in aquatic physiotherapy
- Quadriceps muscle activity during squats in water can be increased at higher speeds of movement
- Prescribing and recording speed with exercise in aquatic rehabilitation is critical to assist with estimating load from drag force.

## SMALL ANIMAL OUTCOME MEASURES

**Hyytiäinen H<sup>1</sup>**

<sup>1</sup>Veterinary Teaching Hospital, Department of Equine and Small Animal Medicine, Faculty of Veterinary Medicine, University of Helsinki, Helsinki, Finland

APG5, Meeting Room C3.4, October 20, 2017, 10:35 AM - 11:35 AM

In addition to our invincible palpation skills (Levine et al 2014), there are numerous objective, validated, reliability and responsiveness tested measurement methods available to all animal physiotherapists. Several tests evaluating the neurological dog patients do exist, but an example of physiotherapy directed functional testing battery is the Finnish Neurological Functional Testing battery (FINFUN), measuring the level of the dog's functionality from various aspects (Boström et al 2017). In the cardiorespiratory field 6 minute walk test has been used to measure the physical performance level of pulmonary and heart diseased dogs, as well as for assessing the severity of the brachycephalic obstructive airway syndrome in certain breeds (Boddy et al 2004, Swimmer et al 2011, Lilja-Maula et al 2017). Musculoskeletal practice may work very reliably with rather cheap and cheerful tools, such as universal goniometers (Jaegger et al 2002, Thomas et al 2006, Nicholson et al 2007), tape measures (Baker et al 2010, Smith et al 2013), algometers (Kaka et al 2015) and slide calipers (Bergfors 2012). If one has access to pressure sensitive walkways, stance analysers and force platforms –even better. In addition to previous, functional tests and disease specific testing batteries already exist or our orthopaedic patients. An example of these is the Finnish Canine Stifle Index (FCSI) testing battery designed to be used to evaluate the outcome of treatment on dogs with stifle disease (Hyytiäinen et al 2013, Hyytiäinen et al 2015). Also, derived from human physiotherapy, the Canine Timed Up and Go has been used with orthopaedic patients, to evaluate the dog's ability to mobilise (Hesbach 2003, McGregor 2012). Knowledge of all available tests and measures is imperative. Selecting the correct ones for each occasion is even more important. Using them correctly is absolutely crucial. But nothing is as important as the skill of interpreting the gained results appropriately.

An updated review of various outcome measures will be provided, along with information on how to practically use some of these measurement methods, which could and should be used daily in the clinical practice and research to support high quality physiotherapy process and practice.

## SEDENTARY BEHAVIOUR IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE – SHOULD INTERVENTIONS TARGET THIS OUTCOME RATHER THAN PHYSICAL ACTIVITY?

**McKeough Z<sup>1</sup>**

<sup>1</sup>*Discipline of Physiotherapy, Faculty of Health Sciences, The University of Sydney, , Australia*

CRP5A, Meeting Room C4.3, October 20, 2017, 10:35 AM - 11:35 AM

### Background:

Sedentary behaviour in the adult population has been receiving attention recently with debates around whether it is the "new smoking!" It is now recognised that people may comply with physical activity guidelines but still spend large amounts of the day being sedentary which may independently lead to poor health outcomes. Research on sedentary behaviour in chronic obstructive pulmonary disease (COPD) is only just emerging partly because more emphasis has been given to determining physical activity levels in this population and ways to improve physical activity. Given the difficulties with promoting physical activity in COPD, interventions to address sedentary behaviour may be more promising.

### Objectives:

To examine the latest evidence on sedentary behaviour in people with COPD.

### Results:

The presentation will explain what sedentary behaviour is and how it differs to physical inactivity, how sedentary behaviour relates to health outcomes in COPD and what interventions are being considered to minimise sedentary behaviour. This work will be presented in the context of what is known in the area of physical activity in COPD and discuss whether a new focus on sedentary behaviour is needed. In particular, interventions which encourage less sitting behaviour and more light intensity activity will be discussed.

### Key Practice Points:

- Sedentary behaviour is an important outcome that clinicians should consider measuring in their patients with COPD.
- This presentation will provide details on the latest interventions being researched to improve sedentary behaviour in COPD.
- If shown to be effective, these interventions may become an important component of future practice.

## FACTORS IMPORTANT TO PEOPLE WITH COPD TO OPTIMISE DAILY TIME-USE: INTER-COUNTRY DELPHI SUB-ANALYSIS

**Williams M<sup>1</sup>**, Lewthwaite H<sup>1</sup>, Effing T<sup>2</sup>, Lenferink A<sup>3</sup>, Olds T<sup>1</sup>

<sup>1</sup>*University Of South Australia, Adelaide, Australia,* <sup>2</sup> *Flinders University of South Australia, Adelaide, Australia,* <sup>3</sup>*Medisch Spectrum Twente , Enschede, Netherlands*

CRP5A, Meeting Room C4.3, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

To identify whether people with COPD from South Australia (SA) and the Netherlands (NL) differed in their perspective of factors considered important to optimize physical activity (PA), sedentary behavior (SB) and sleep (S).

### Design:

Delphi sub-analysis.

### Methods:

In Round 1, participants were asked: "What is important for people with COPD to: 1) stay active, 2) reduce sitting/lying, 3) improve sleep quality?" Responses were developed into items (Likert scale importance rating 1 to 9) and grouped by theme. Items meeting a priori criterion for agreement (Median  $\geq 7$ , IQR  $\leq 2$  or IQR  $> 2$ )

were retained in subsequent rounds. In Round 4, items from each group were combined and rated by all participants.

#### Results:

44 COPD participants consented, 38 completed Round 4 (86% retention rate: SA n = 24; NL n = 14). Groups were similar for age (years: SA  $66.8 \pm 9.7$ ; NL  $69.9 \pm 6.1$ ), sex (male: SA 54%; NL 60%) and breathlessness (mMRC  $\geq 2$ : SA 81%; NL 73%), however the SA group were slightly less active (Median [IQR] active d/week: SA 1.5 [0 - 3]; NL 2.0 [2 - 4.5]). Theme agreement was high between groups for PA and SB (71%), and S (84%). The NL group rated items around engaging in volunteer work and dog walking as more important.

#### Conclusion/Key Practice Points:

- Between people with COPD from SA and NL, consensus was high for factors considered important to optimize PA, SB and S.
- Factors identified in this Delphi may assist in developing culturally appropriate interventions.

#### THE DOSE-RESPONSE ASSOCIATION BETWEEN TOTAL PHYSICAL ACTIVITY AND MORTALITY RISK IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A POPULATION-BASED COHORT STUDY

**Cheng S<sup>1</sup>**, McKeough Z<sup>1</sup>, Alison J<sup>1</sup>, Dennis S, Hamer M<sup>2</sup>, Stamatakis E<sup>3</sup>

<sup>1</sup>Discipline of Physiotherapy, The University of Sydney, Sydney, Australia, <sup>2</sup>University of Loughborough, Loughborough, United Kingdom, <sup>3</sup>Charles Perkins Centre, School of Public Health, Prevention Research Collaboration, The University of Sydney, Sydney, Australia

CRP5A, Meeting Room C4.3, October 20, 2017, 10:35 AM - 11:35 AM

#### Aim:

To examine the association between total physical activity and mortality risk in people with chronic obstructive pulmonary disease (COPD).

#### Design:

A population-based cohort study.

#### Methods:

People with COPD aged  $\geq 40$  years were identified from the 1997 Health Survey for England and the 1998 and 2003 Scottish Health Survey cohorts. Self-reported total physical activity was assessed at baseline, and was classified into four groups based on the degree of adherence to the current physical activity guidelines ( $\geq 7.5$  MET-hours/week of physical activity). Cox proportional hazards models were used to examine the association between physical activity and mortality risk.

#### Results:

2398 participants with COPD were included in the analysis (mean age (SD) 62.6 (11.5), mean FEV1% predicted 73.4% (25.4), 52% men). Over 8.5 (3.9) years follow-up, there were 571 deaths. Participants who met the guidelines demonstrated the greatest reduction in mortality risk (hazard ratio 0.56, 95% CI 0.45 to 0.69) compared to those who reported no physical activity. Participants who did not meet the guidelines but achieved at least 3.75 MET-hours/week of physical activity also had a reduced risk of mortality (hazard ratio 0.75, 95% CI 0.56 to 1.00). No significant mortality risk reductions were observed below this threshold.

#### Conclusions/Key Practice Points:

- There is a dose-response association between total physical activity and mortality risk in people with COPD.
- A minimum of 3.75 MET-hours/week of total physical activity may be sufficient to gain mortality benefit in people with COPD, although there is added benefit in adhering to the physical activity guidelines.

## ASSOCIATIONS OF PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR PHENOTYPES WITH MORTALITY IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE

**McKeough Z<sup>1</sup>**, Cheng S<sup>1</sup>, Alison J<sup>1,2</sup>, Stamatakis E<sup>3</sup>

<sup>1</sup>Faculty of Health Sciences, The University of Sydney, Sydney, Australia, <sup>2</sup>Allied Health Professorial Unit, Sydney Local Health District, Sydney, Australia, <sup>3</sup>School of Public Health, Charles Perkins Centre, Sydney, Australia

CRP5A, Meeting Room C4.3, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

To examine the association of four activity phenotypes with mortality in people with chronic obstructive pulmonary disease (COPD).

### Design:

A prospective cohort study

### Method:

People with COPD aged > 40 years were identified from the 2003 Scottish Health Survey and were grouped into one of the following phenotypes: 1) 'Busy Bees': sufficiently active/low leisure-based sitting time; 2) 'Sedentary Exercisers': sufficiently active/high leisure-based sitting time; 3) 'Light Movers': insufficiently active with some domestic activity, or 4) 'Couch Potatoes': insufficiently active/high leisure-based sitting time and/or no domestic activity. 'Sufficiently active' involved adhering to activity recommendations of at least 7.5 MET hours/week (equivalent to 150 minutes/week of moderate physical activity). 'Low leisure-based sitting time' was defined as a maximum of 200 minutes of recreation screen time per day. Cox proportional hazards models were used to examine the association between the phenotypes and mortality.

### Results:

The sample comprised 584 people with COPD (mean age (SD) 63.8 (11.5) years, 52% male). Over 5.5 (1.3) years follow-up, there were 81 all-cause deaths from 433 COPD participants with available data. Compared to the 'couch potatoes', there was a reduced risk of all-cause mortality in the 'busy bees' (hazard ratio 0.26, 95% CI 0.11 to 0.65) with a trend towards reduced mortality risk in the other phenotypes (p trend = 0.02).

### Conclusions:

- Measuring activity levels and sedentary behaviour in COPD are important for health outcomes.
- Adhering to current activity guidelines and keeping recreation screen time low may provide a mortality benefit in COPD.

## DOES EARLY PERIODIC NON-INVASIVE VENTILATION PREVENT RESPIRATORY COMPLICATIONS FOLLOWING HIGH-RISK ELECTIVE UPPER ABDOMINAL SURGERY?

**Lockstone J<sup>3</sup>**, Boden I<sup>3</sup>, Denehy L<sup>1</sup>, Parry S<sup>1</sup>

<sup>1</sup>The University of Melbourne, Parkville, Australia, <sup>2</sup>Physiotherapy Department, Launceston General Hospital, Launceston, Australia, <sup>3</sup>Clifford Craig Medical Research Trust, Launceston, Australia

CRP5B, Meeting Room C4.7, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

To determine: 1) efficacy of early periodic Non-Invasive Ventilation (NIV) to prevent respiratory complications following high-risk elective upper abdominal surgery (UAS) and, 2) the safety and feasibility of a physiotherapy-delivered NIV protocol.

### Design:

Prospective, pre-post cohort, single centre study.

### Method:

Pre-cohort: 101 consecutive high-risk elective UAS patients from July 2013 to September 2015; Post-cohort: 81 consecutive high-risk elective UAS from April 2016 to January 2017. Both groups received pre-operative physiotherapy education and postoperative early ambulation. The post-cohort group received additional 30 minute NIV sessions once on day zero and twice on day one and two. Primary outcome measure was

postoperative pulmonary complication (PPC) within first seven days. Secondary outcomes: 1) feasibility of implementation and 2) NIV safety.

**Results:**

PPC incidence was significantly lower in the NIV group compared to the no-NIV group (7% vs 18%,  $p = 0.02$ , one-sided power 0.92, relative risk 0.42, 95% CI 0.17 to 0.99) with number needed to treat of 10 (95% CI 5 to 247). Postoperative NIV was achieved in 74% of participants within 24 hours following surgery with mean time to first NIV session 18.6 (SD 10.99) hours. There were no severe adverse events.

**Conclusion/Key Practice Points:**

- This preliminary study suggests a reduction in PPCs with the addition of postoperative NIV following high-risk UAS.
- Physiotherapy-driven NIV is feasible and safe in this cohort.
- Results require testing in a parallel-group randomised control trial with standardised early ambulation and blinded assessors.

## POSTOPERATIVE PULMONARY COMPLICATIONS FOLLOWING MAJOR HEAD AND NECK CANCER SURGERY

**Shaw L<sup>1</sup>**, Granger C<sup>1,2</sup>

<sup>1</sup>Melbourne Health, Parkville, Australia, <sup>2</sup>The University of Melbourne, Melbourne, Australia

CRP5B, Meeting Room C4.7, October 20, 2017, 10:35 AM - 11:35 AM

**Aim:**

To identify the incidence of postoperative pulmonary complications as defined by the Melbourne Group Scale in surgically treated head and neck cancer patients requiring tracheostomy in an Australian tertiary hospital.  
To examine the risk factors for postoperative pulmonary complications in this population

**Method:**

A prospective observational study on consecutive patients undergoing major head and neck surgery requiring a tracheostomy was conducted at Royal Melbourne Hospital, Australia from September 2013 to November 2014. Presence of postoperative pulmonary complications was screened for daily using the Melbourne Group Scale (Version 2). Comorbidities were measured using the Colinet Comorbidity Score. Data are presented as mean  $\pm$  standard deviation.

**Results:**

Data were collected for 60 patients (age  $59.0 \pm 16.5$  years, 65% male,  $5.7 \pm 4.1$  Colinet score). Postoperative pulmonary complication occurred in 10 (17%) of patients and did not statistically correlate with preoperative or perioperative variables including age, comorbidities or duration of anesthetic. The sole predictor of postoperative pulmonary complications development was time to sit out of bed post surgery ( $p=0.038$ ).

**Conclusion/Key Practice Points:**

- Patients undergoing major head and neck surgery requiring a tracheostomy experience a high incidence of postoperative pulmonary complications.
- This is the first study in an Australian major head and neck cancer surgical population to examine postoperative pulmonary complication risk predication and to document a standard of physiotherapy practice.
- Further research is required to establish the role of physiotherapy in the management of postoperative pulmonary complications in this population in addition to the promotion of early mobilisation.

## PRE-OPERATIVE RESPIRATORY PHYSIOTHERAPY EDUCATION AND TRAINING IS MEMORABLE AND HAS HIGH TREATMENT FIDELITY: A NESTED MIXED-METHODS RANDOMISED CONTROLLED TRIAL.

**Boden I<sup>1,2,4</sup>**, El-Ansary D<sup>2</sup>, Zalucki N<sup>1</sup>, Browning L<sup>2,5</sup>, Skinner E<sup>2,5</sup>, Robertson I<sup>3,4</sup>, Denehy L<sup>2</sup>

<sup>1</sup>Physiotherapy Department, Launceston General Hospital, Launceston, Australia, <sup>2</sup>The University of Melbourne, Melbourne, Australia, <sup>3</sup>School of Health Sciences, University of Tasmania, Launceston, Australia, <sup>4</sup>Clifford Craig Foundation, Launceston, Australia, <sup>5</sup>Division of Allied Health, Western Health, Melbourne, Australia

CRP5B, Meeting Room C4.7, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

To assess the memorability and treatment fidelity of pre-operative physiotherapy education and training prior to upper abdominal surgery when compared to an information booklet alone.

### Design:

Nested, parallel-group, randomised, active-controlled, triple-blinded (patient, assessor, analyst) mixed-methods trial with concealed allocation and intention-to-treat analysis.

### Methods:

Twenty-nine participants awaiting upper abdominal surgery attending pre-admission clinic at a regional Australian hospital received a standardised physiotherapy assessment and information booklet about prevention of pulmonary complications. Intervention participants received an additional 30-minute education and training session on preventing pulmonary complications and were taught self-directed post-operative breathing exercises. Primary outcome was proportion of participants who remembered the breathing exercises postoperatively. Secondary outcomes were recall of information sub-items and memorability of pre-operative physiotherapy. Outcomes were measured using standardised quantitative scoring and thematic qualitative analysis of digitally-recorded interviews taken on the fifth post-operative day.

### Results:

Compared to control participants, intervention participants were five to six-times more likely to remember the breathing exercises (RR 6.1, 95% CI 1.7 to 22,  $p < 0.001$ ) and information sub-items (RR 5.3, 95% CI 1.3 to 18,  $p < 0.001$ ), and 11-times more likely (RR 11.1, 95%CI 1.6 to 70,  $p < 0.001$ ) to report that physiotherapy was the most memorable part of the entire pre-admission clinic. Intervention participants liked the personal delivery of detailed, interesting, and practical pre-operative information that aimed to improve their recovery.

Conclusion: Pre-operative physiotherapy education and training prior to upper abdominal surgery is memorable, has high treatment fidelity, with patients preferring face-to-face delivery of information.

Trial registration: ACTRN-12613000664741

## YEAR IN REVIEW - SURGERY

**Thomas P<sup>1</sup>**

<sup>1</sup>Royal Brisbane and Women's Hospital, Brisbane, Australia

CRP5B, Meeting Room C4.7, October 20, 2017, 10:35 AM - 11:35 AM

### Background:

Physiotherapists provide services to patients undergoing major abdominal, thoracic, cardiac surgery and post trauma surgery aimed at preventing post-operative pulmonary complications and restoring mobility and function.

### Objectives:

To review recent literature that may influence physiotherapy practice in surgical and trauma settings.

### Results:

Physiotherapy resources are concentrated around the provision of post-operative care. However, higher levels of pre-operative physical activity have been associated with fewer post-operative pulmonary complications, early attainment of independent mobilisation and shorter hospital length of stay. Subsequently, the ability to increase levels of physical activity (e.g. aerobic exercise and/or resistance training) prior to

surgery should be further explored and may require health care providers like physiotherapists to focus more resources towards pre-operative interventions. Inspiratory muscle training may also reduce length of stay with benefits particularly in older and high-risk patients and can be started pre-operatively.

Investigations into the routine use of high flow nasal cannula after major abdominal or thoracic surgery have not demonstrated significant benefits. Non-invasive ventilation may provide short-term benefits on lung function. Enhanced recovery after surgery pathways that include early mobilisation as a component continue to demonstrate reductions in hospital length of stay in both elective and trauma settings. Pain management strategies continue to evolve and may also enhance the earlier attainment of mobilisation and reduce length of stay.

Key Practice Points:

- Physiotherapists should review their ability to engage patients pre-operatively and examine their ability to improve physical activity and respiratory function before surgery.

## ENSURING AUSTRALIAN PHYSIOTHERAPY GRADUATES ARE WORK-READY TO MEET THE REQUIREMENTS OF CLINICAL PRACTICE

**Butler J<sup>1</sup>**

<sup>1</sup>*Australian Catholic University, Sydney, Australia*

EDU5, Meeting Room C4.11, October 20, 2017, 10:35 AM - 11:35 AM

Over the last two decades, health-care in Australia has undergone rapid change that is most apparent in a reduction and distribution of health-care funding along with change in provision of care in terms of patterns and models of health care delivery. The growing focus on health promotion and illness prevention in the general population means that health profession graduates need to be sufficiently prepared to provide primary health care in community settings and to deliver a holistic health-care service. Consequently the required knowledge base for health professionals has changed and requires broader skills of communication, collaboration and teamwork. The challenge for physiotherapy educators, in both the academic and clinical environment, is to not only prepare graduates with entry-level physiotherapy knowledge and skills, but also to challenge them to become critical and reflective thinkers who are confident to approach novel situations which they may encounter in their working environment.

One of the main drivers for physiotherapy graduates entering the clinical workforce is to be able to meet the entry-level Physiotherapy practice thresholds in Australia and Aotearoa New Zealand (2015). Previous studies have identified a broad range of desirable attributes that are deemed to determine workplace readiness for physiotherapy graduates. However, many of these studies have focussed on a specific area of practice rather than a broad scope of physiotherapy practice, and were conducted prior to the release of the thresholds. Therefore, it is relevant to investigate what the requirements are to be work-ready in terms of being congruent with the current Physiotherapy practice thresholds.

Key Practice Points/questions:

- What does it mean to be 'work-ready'?
- What are the requirements for physiotherapy graduates to be work-ready in Australia?
- Are these requirements congruent with the Physiotherapy practice thresholds in Australia and Aotearoa New Zealand (2015)?• How do we prepare physiotherapy graduates to be work-ready for clinical practice?

## RECOVERING FROM HIP FRACTURE IN A NURSING HOME

**Killington M**

<sup>1</sup>*South Australia Brain Injury Rehabilitation Services, Adelaide, Australia*

GPA5, Meeting Room C3.6, October 20, 2017, 10:35 AM - 11:35 AM

Aim:

To understand the journey experienced by nursing home residents following hip fracture and impressions of an outreach rehabilitation program offered after their return home.

#### Results:

Both family members and staff described nursing home residents with dementia as receiving poor post-operative care from hospital staff who seemed unfamiliar with dementia and delirium. Discharge from hospital soon after surgery (median 4.5 days) occurred with poor transfer of information. Difficulties with residents' emotions, pain management and commencing mobilisation seemed more prevalent within usual care group, whereas fewer overall problems were encountered by those with access to a geriatrician and additional therapy.

#### Implications:

- This research suggests that an integrated care pathway including the hospital stay and first weeks back at nursing homes should be developed. Performance indicators should include carer measures on the quality of the transfer, pain management measures in the first month and return to walking.
- Effect of affordable technology on physical activity levels and mobility outcomes in rehabilitation: a protocol for the Activity and MObility USiNg Technology (AMOUNT) rehabilitation trial.

#### MOTIVATIONAL INTERVIEWING CAN INCREASE PHYSICAL ACTIVITY THROUGH INCREASING SELF-EFFICACY IN COMMUNITY-DWELLING PEOPLE AFTER HIP FRACTURE

**Taylor N**<sup>1,2</sup>, O'Halloran P<sup>1</sup>, Shields N<sup>1,3</sup>, Blackstock F<sup>4</sup>, Wintle E<sup>2</sup>

<sup>1</sup>La Trobe University, Ashburton, Australia, <sup>2</sup>Eastern Health, Bundoora, Australia, <sup>3</sup>Northern Health, Epping, Australia, <sup>4</sup>Western Sydney University, Campbelltown, Australia

GPA5, Meeting Room C3.6, October 20, 2017, 10:35 AM - 11:35 AM

#### Aim:

To determine if motivational interviewing improved physical activity, falls self-efficacy, and walking confidence in community-dwelling older people after hip fracture.

#### Design:

Randomised controlled trial with assessor blinding.

#### Method:

Thirty adults (mean age 82.3±5.7 years, 21 women) discharged from rehabilitation to independent living in the community after hip fracture were allocated to an intervention group receiving eight weekly sessions of telephone-based motivational interviewing (n = 16) or to a usual care control group (n = 14).

#### Outcome measures:

The primary outcome was accelerometer-measured physical activity (daily steps, daily time walking, daily time sitting/lying). Secondary outcomes included falls self-efficacy, and confidence about walking.

#### Results:

Compared to usual care, the intervention group took more daily steps (MD = 1,237 steps, 95%CI 12 to 2,463), had increased daily walking time (MD = 14.4 minutes, 95%CI 0.6 to 28.8), and no difference in daily time sitting/lying (MD -0.3 hours, 95%CI -1.2 to 0.6). Participants had improved falls self-efficacy (MD 1.1 units, 95% CI 0.3 to 1.9) and confidence about walking (MD 1.6 units, 95%CI 0.3 to 2.9). Mediation analysis confirmed that falls self-efficacy was a significant predictor of daily walking time (p = 0.03), while controlling for the independent variable of group allocation, with group  $\beta$  reduced from .284 to .059.

#### Conclusions/Key practice points:

- Motivational interviewing can result in clinically meaningful increases in physical activity for community-dwelling people recovering from hip fracture.
- Improvements in physical activity were likely mediated through increasing confidence in walking and self-efficacy about falling.

Trial registration: ACTRN12613000680763

## THE MAXIMUM TOLERATED AMOUNT OF WALKING FOR COMMUNITY-DWELLING ADULTS AFTER HIP FRACTURE

**Peiris C<sup>1</sup>**, Shields N<sup>1,2</sup>, Kingsley M<sup>1</sup>, Yeung J<sup>2</sup>, Hau R<sup>2,3</sup>, Taylor N<sup>1,4</sup>

<sup>1</sup>La Trobe University, Melbourne, Australia, <sup>2</sup>Northern Health, Epping, Australia, <sup>3</sup>University of Melbourne, Parkville, Australia, <sup>4</sup>Eastern Health, Box Hill, Australia

GPA5, Meeting Room C3.6, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

To determine the maximum tolerated dose of prescribed walking per week for community-dwelling adults after hip fracture.

### Design:

Phase I dose-response design. Dose escalation occurred between cohorts of participants depending on tolerability and the presence or absence of adverse events.

### Method:

Community-dwelling adults (n = 21, 16 women, mean age 75 ± 9 years) who were cognitively alert, attending community rehabilitation after hip fracture (mean 110 ± 47 days post fracture) and able to walk with or without a gait aid were recruited from two community rehabilitation centres in Melbourne, Australia. Participants were individually supervised completing prescribed doses of moderate intensity walking over one week, in addition to their usual activity. Three participants were required to complete a dose of walking prior to dose escalation for the next cohort of three participants. Dose escalation ceased when more than one participant in a cohort had an adverse event or was unable to tolerate the dose. Outcomes were maximum tolerated dose of walking per week (minutes), mobility and walking confidence.

### Results:

The maximum tolerated dose of walking was 100 minutes per week. No adverse events occurred but participants were unable to tolerate higher doses. Post-walking, participants had improved mobility; no changes were detected for walking confidence.

### Conclusion/Key Practice Points:

- There is preliminary evidence that it is safe and feasible for community-dwelling older adults recovering from hip fracture to complete 100 minutes of moderate intensity walking per week
- Clinicians should feel more confident when encouraging their patients to participate in regular walking.

## DOING NOTHING FOR PATIENTS IN PAIN: PLACEBO AS A MECHANISM OF INTERVENTIONS

**Bialosky J<sup>1</sup>**

<sup>1</sup>University of Florida, Gainesville, United States

MPA5, Darling Harbour Theatre, October 20, 2017, 10:35 AM - 11:35 AM

Placebo is traditionally defined as inactive and having no treatment value. In contrast, many healthcare providers admit to the use of placebo interventions in clinical practice and placebo interventions are associated with a robust effect on pain. This presentation will focus on placebo interventions not as a inert comparative arms in controlled studies but rather as a mechanism of all interventions for pain. Specifically, the presentation will highlight key mechanisms of placebo responses including expectation and conditioning; placebo as a means of top down pain inhibition with consistent neurological responses; limitations in current placebo controlled trials of physical therapy interventions for pain; and ethical considerations related to integrating placebo interventions into clinical practice.

Key Practice Points: While not advocating for clinicians to provide placebo interventions to their patients, this presentation will contribute to participants' practice through providing insight into

- Placebo as a mechanism for all interventions for pain,
- How best to maximize the placebo response to all interventions, and
- Interpreting placebo controlled studies of common rehabilitation interventions for pain.

## DO BELIEFS OR EVIDENCE DICTATE THE WAY THAT WE MANAGE LOW BACK PAIN?

**O'Sullivan P**

<sup>1</sup>Curtin University, Perth, Australia

MPA5, Darling Harbour Theatre, October 20, 2017, 10:35 AM - 11:35 AM

It is commonly believed that: low back pain (LBP) is caused by an injury and or damage to the spine, that backs need to be protected, postures controlled, the 'core' strengthened and activities that cause pain modified. Physiotherapy practice often reinforces this belief with interventions to correct 'biomechanical faults' presumed to underlie LBP. These approaches together have not arrested the escalating cost and disability burden of LBP in our community.

Contemporary research suggests that LBP often develops in adolescence and sets a trajectory for later life, presenting more as a chronic disorder than an injury. Findings on MRI scan correlate poorly with a person's level of pain and disability and biomechanical faults are not strongly causally linked to LBP. There is growing evidence that disabling LBP is associated with unhelpful beliefs and pain related fear leading to avoidance and protective behaviors. This process is reinforced by consolidation of fear and pain memories leading to pain sensitisation.

There is growing evidence that interventions that: provide a personalized evidence based understanding of LBP, expose people to feared and avoided valued activities with pain control and address unhelpful lifestyle behaviors, may provide larger benefits. This approach demands a mindset change on the part of patients and physiotherapists.

Key Practice Points:

- Disabling LBP is associated with negative beliefs, pain related fear and unhelpful protective and avoidance behaviors leading to sensitisation and disability
- Interventions that challenge these beliefs and behaviours have the potential to reduce the burden of pain and disability
- Memory processes are likely underpin these changes

## AT THE CROSSROADS – ARE WE FORGETTING THE BIO IN THE BIO-PSYCHOSOCIAL?

**McConnell J**

MPA5, Darling Harbour Theatre, October 20, 2017, 10:35 AM - 11:35 AM

Patients come to physiotherapy for the treatment of pain. We all know that pain is an unpleasant sensory or emotional experience associated with actual or potential tissue damage. We also know that pain is a cortical experience, which means that the manifestation and the intensity of the pain is influenced by numerous extrinsic, as well as, intrinsic factors. We are fortunate in Australia that pioneers in our profession like Geoff Maitland paved a way for us to become first contact practitioners, which we have had the privilege to enjoy for over 40 years. Maitland instigated a very vigorous subjective and objective examination process which was unique, particularly the value of the asterisk sign to reassess the immediate effectiveness of the physiotherapy treatment on the patient's symptoms. There is a tendency in physiotherapy today however, to label any patient with a chronic musculoskeletal condition, particularly with multiple sites of pain as being only suitable for "hands off" physiotherapy and forget the 'bio' part of the bio-psychosocial. The patient is duly diagnosed with complex regional pain syndrome requiring drug intervention and general exercise programs. While the psychosocial components influence pain, we should not forget the peripheral causes of the pain which need to be addressed if the patient is to manage their symptoms. This paper will examine the "bio" effect of knee pain and the consequent cascade to multi-area problems.

Key Practice Points:

- Improve the understanding of the long term effects of pain in the lower limb and the consequent effect on gait
- Briefly describe the biological effect of fear of pain on muscle activity
- Increase knowledge of the muscular changes occurring in the lower limb as a result of long standing knee pain following a partial menisectomy for a degenerate meniscus.

## THE EFFECTIVENESS OF AFFORDABLE TECHNOLOGY IN REHABILITATION TO IMPROVE MOBILITY AND PHYSICAL ACTIVITY: AMOUNT (ACTIVITY AND MOBILITY USING TECHNOLOGY) REHABILITATION TRIAL

**Sherrington C<sup>1</sup>**

<sup>1</sup>University of Sydney, Sydney, Australia

NNG5, Meeting Room C4.8, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

To evaluate the effect of the addition of affordable technology to usual care on physical activity and mobility in people with mobility limitations admitted to inpatient aged and neurological rehabilitation units compared to usual care alone.

### Design:

A pragmatic, assessor blinded, parallel-group randomised trial of 300 consenting rehabilitation inpatients with reduced mobility.

### Method:

The intervention group received technology-based exercise to target mobility and physical activity problems for 6 months. The technology included the use of video and computer games/exercises and tablet applications as well as activity monitors. The control group received no additional intervention and both groups received usual rehabilitation care over the 6-month study period. The co-primary outcomes were objectively assessed physical activity (proportion of the day spent upright) and mobility (Short Physical Performance Battery, SPPB) at 6 months after randomisation. Primary analyses used an intention-to-treat approach. Linear models assessed the effect of group allocation for each continuously scored outcome measure.

### Results:

Participants had an average age of 74 (SD14), 50% were female; 54% had neurological health conditions and 39% reported no technology exposure prior to hospital admission. At baseline participants had reduced mobility (mean SPPB score 4.2/12, SD 2.6) and a mean (SD) upright time of 111.2min/day (89.7) measured with activPAL. Trial results will be reported in this presentation.

### Conclusion/Key Practice Points:

- Technologies to enable ongoing exercise are likely to become increasingly important in the future as the proportion of older people in the population increases and resources to provide rehabilitation care become more limited.

## ACTIVE ARMS IN PARKINSON'S DISEASE: A RANDOMIZED CONTROLLED TRIAL OF INTERACTIVE, UPPER-EXTREMITY EXERGAMES

**Allen N<sup>1</sup>**, Song J<sup>2</sup>, Paul S<sup>1</sup>, Smith S<sup>3</sup>, O'Duffy J<sup>4</sup>, Schmidt M<sup>5</sup>, Love R<sup>1</sup>, Sherrington C<sup>1</sup>, Canning C<sup>1</sup>

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NNG5, Meeting Room C4.8, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

To determine if exergames targeting the upper extremity: (i) improve upper extremity activities and impairments; and (ii) are acceptable and feasible in people with Parkinson's disease.

### Design:

Randomised controlled trial of an upper extremity exergame intervention, with concealed allocation, blinded outcome assessment and intention-to-treat analysis.

### Method:

Community-dwelling people with Parkinson's disease and intact cognition were included. The exergame group (n=19) performed the games at home, three times per week for 12 weeks. The control group (n=19) continued their usual activities. The primary outcome measure was the nine hole peg test. Secondary outcomes included measures of upper extremity activities and impairments, including tapping test speed

(taps/60s) and error (weighted error score/speed) scores. Acceptability of the intervention was assessed via questionnaire. Between group differences were analysed using linear regression.

#### Results:

There were no statistically significant between-group differences in any measures except for the tapping test, which showed that exergame participants improved their speed (mean difference = 10.9 taps/60s,  $p < 0.001$ ), but increased their errors (mean difference = 0.03,  $p = 0.03$ ) compared to the control group. Overall, participants enjoyed playing the games, though they reported tiring of them by week 12. There were no adverse events.

#### Conclusion/Key Practice Points:

- The exergames were acceptable and safe, but did not improve participants' abilities to perform upper extremity activities.
- The improvements in movement speed and decrement in accuracy may be explained by specificity of task practice, as the exergames prioritised fast over accurate movements.
- Exergame design should consider specificity of task practice.

Trial registration: ACTRN12614001048673

#### CAN INTERACTIVE, MOTION-CAPTURE BASED REHABILITATION IN AN INPATIENT STROKE POPULATION INCREASE PHYSICAL ACTIVITY LEVELS?

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NNG5, Meeting Room C4.8, October 20, 2017, 10:35 AM - 11:35 AM

#### Aim:

To determine if interactive, motion-capture based rehabilitation can increase the activity levels of stroke survivors in inpatient rehabilitation compared to usual care, particularly during therapy time.

#### Design:

Randomised control trial

#### Methods:

Patients ( $n = 66$ ) admitted to two subacute rehabilitation units with recent ( $< 6$  months) stroke were randomly allocated into usual care or an intervention group. The intervention group used the Jintronix system (<http://www.jintronix.com/>), utilising a motion-capture camera to allow body movements to drive gameplay, completing prescribed games targeting their rehabilitation needs. The control underwent group exercises on one unit and 1:1 therapy with a rehabilitation assistant on the other unit. Both groups also received additional functional retraining. Both groups wore ActivPAL (PAL Technologies, Glasgow, UK) activity monitors continuously for seven days. Activity levels were quantified by percentage of time spent upright and compared using t-tests.

#### Results:

Upright positioning activity levels during daily awake hours were similar between the groups (usual care 14 %, intervention 12 %,  $p = .24$ ). During therapy time, the intervention group spent more time upright performing standing and stepping tasks (55 % upright positioning), than the usual care group (45 % upright positioning) ( $p = .01$ ).

#### Conclusions:

These results demonstrate that using the technology platform increased the amount of time in standing and stepping activity during therapy.

#### Key Practice Points:

- Interactive, motion-capture based rehabilitation can increase the amount of time spent in standing and stepping task during inpatient stroke rehabilitation.

### MOTOR IMPAIRMENTS IN CHILDREN BORN PRETERM – THE STATE OF PLAY

**Spittle A<sup>1,2,3</sup>**

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NPG5, Meeting Room C4.1, October 20, 2017, 10:35 AM - 11:35 AM

Over the past two decades, survival rates of children born preterm, have improved, however, their rates of morbidity remain high. The earlier a baby is born, the higher the risk of impairment. For those infants who are born less than 32 weeks' gestation, 5-15% will have cerebral palsy and up to 50% will have developmental coordination disorder. Our research is investigating how motor development changes over time and whether rates of developmental co-ordination disorders increase, decrease or remain similar over time. Importantly, we are also investigating what factors influence changes in motor performance and other domains of neurodevelopment.

Whilst children born very preterm and their families are a heterogeneous group, with variable neurodevelopmental outcomes, there are several risk factors known to adversely influence child development and parental well-being, including medical, social and environmental factors. It is well known that medical factors such as brain injury and respiratory disease in preterm infants have an adverse effect on developmental outcomes. However, social and environmental factors, especially post-discharge from hospital, also play a pivotal role in child development. Social risk factors, such as low income or lower caregiver education levels have been associated with poorer neurodevelopmental outcomes for children born early. Our research is looking at ways of making early detection and early intervention more accessible. We have created a smart-phone app to help in the early detection of motor impairments, making early detection more accessible to families in remote and rural areas. As physiotherapists, we have a pivot role in early detection and targeting early intervention services.

#### Key Practice Points:

- Children born preterm are at increased risk of a range of motor impairments compared to their term born peers.
- Motor impairments can be detected early in development in preterm children and physiotherapists have an important role in developmental surveillance.
- Early intervention services need to be targeted to the individual child and their family's needs.

### CLINICAL GUIDELINES FOR EARLY DIAGNOSIS, ASSESSMENT AND INTERVENTION IN CEREBRAL PALSY

**Morgan C<sup>1</sup>**

<sup>1</sup>The University of Sydney, Sydney, Australia

NPG5, Meeting Room C4.1, October 20, 2017, 10:35 AM - 11:35 AM

Cerebral palsy is the most common physical disability in childhood and is typically diagnosed between 12-24 months of age. IMPACT for CP, an international, multidisciplinary research network, unanimously agreed to develop a suite international clinical practice guidelines on early detection, assessment and intervention for infants at high risk of CP. High quality evidence indicates that for infants less than 5-months corrected age, with newborn detectable risk for CP, early detection is over 95% accurate when the right combination of assessments are used, including the General Movements Assessment and MRI. High quality evidence also indicates that for infants older than 5-months corrected age, with high-risk for cerebral palsy, early detection is over 90% accurate when the Hammersmith Infant Neurological Examination (HINE) and early MRI are used in combination.

Early detection of high-risk of CP, should be followed by CP-specific early intervention and should be the standard of care to optimize infant neuroplasticity, prevent complications and enhance parent well-being. Implementation at both practice and policy levels is recommended. This invited presentation will present the

evidence base behind the development of the guidelines, and present key recommendations for clinical practice for physiotherapists working in early intervention contexts. Future research directions will be highlighted.

Key Practice Points: Participants will have:

- New knowledge of the best-available evidence on accurate early detection of cerebral palsy published in an international clinical practice guideline and the roles of the multidisciplinary team
- New knowledge of the most psychometrically sound instruments for the early assessment of motor skills in infants with or at high risk of CP
- Updated knowledge of the most evidence based interventions to improve motor outcomes for infants with or at high risk of CP.

## WORK DESIGN: IMPROVING THE PSYCHOSOCIAL QUALITY OF WORK

**Parker S**

OHP5, Meeting Room C3.3, October 20, 2017, 10:35 AM - 11:35 AM

Designing work to reduce psychosocial risks has long been an important topic, and it is arguably more important than ever. Changing organisational forms, digitalization of work processes, and an ageing workforce are just some of the changes that are occurring in contemporary workplaces. At the same time, we are witnessing increases in mental health issues in the workplace along side rising obesity and health-related diseases exacerbated by excessively sedentary work. Against this background, the topic of work design - or the nature and organisation of work tasks, responsibilities, and activities - is of vital importance. In this presentation, I will give examples of psychosocial work redesign; recap on what we know about psychosocial work design so far, and I will sketch out a research and practical agenda for the future. I will discuss important practical and policy considerations to help keep work design on the agenda, including the need for co-operation across multiple professional groups.

Key practice points:

- A deeper understanding of psychosocial work design, including what the importance elements are.
- Examples of psychosocial work redesign
- Consideration of factors that shape psychosocial work design
- Suggestions for policy and practice as to how to keep work design on the agenda.

## GOAL ATTAINMENT SCALING TO EVALUATE THE EFFECT OF INTERVENTION ON INDIVIDUAL GAINS IN EXTREMELY PRETERM CHILDREN WITH MINIMAL/MILD IMPAIRMENT

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R5-5, Meeting Room C4.2, October 20, 2017, 10:35 AM - 11:35 AM

Aim:

To evaluate the effect of group-based physiotherapy on individual gains in four-year old children born extremely preterm and/or extremely low birth weight with minimal/mild impairment using Goal Attainment Scaling and the relationship of Goal Attainment Scaling performance to motor and postural outcomes after intervention.

Design:

Pre/post evaluation study of change in Goal Attainment Scaling scores after intervention; and relationships between Goal Attainment Scaling performance and other measures.

Method:

Twenty-four four-year old children (born <28 weeks gestation and/or birth weight <1,000g) with minimal/mild motor impairment on Neurosensory Motor Developmental Assessment (9 to ≤12) at four year clinic assessment were included. Intervention was six group-based weekly physiotherapy sessions and a goal-

based home program. Assessments occurred pre/post intervention and included Goal Attainment Scaling, Movement Assessment Battery for Children Second-Edition, single leg stance test, lateral reach test and standing long jump test. Data analysis involved converting Goal Attainment Scaling scores into T-scores, with a score of  $\geq 50$  indicating that goals were attained.

#### Results:

Goal Attainment Scaling mean T-score of the group improved, exceeding expected goal of "0" score after intervention (mean=58.2, SD=0.82). Goal Attainment Scaling mean T-score and Movement Assessment Battery for Children percentile were moderately correlated ( $r=0.42, p=0.04$ ). Females improved more than males ( $p=0.05$ ).

#### Conclusion/Key Practice Points:

- Group-based physiotherapy intervention has benefits in the short-term.
- Goal Attainment Scaling is a suitable tool to use with these type of children.
- Goals were related to motor co-ordination.
- Male gender is a risk factor for less favourable outcomes, therefore males may need to be monitored more closely.

### RELIABILITY AND VALIDITY OF ELECTROMAGNETIC TRACKING FOR THE MEASUREMENT OF CERVICAL SPINE KINEMATICS DURING RUGBY UNION SCRUMS

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R5-5, Meeting Room C4.2, October 20, 2017, 10:35 AM - 11:35 AM

#### Aim:

This study assessed the test-retest reliability and validity of an electromagnetic tracking system for measuring cervical spine kinematics during Rugby Union scrummaging.

#### Design:

Repeated measures.

#### Method:

Ten males (five front-rowers, five non-players) each performed seven one-man scrums against a scrum machine. Three-dimensional cervical spine kinematics were measured with an electromagnetic tracking and optoelectronic system simultaneously. Relative reliability (intraclass correlation coefficient, coefficient of multiple correlation) and absolute reliability (standard error of measurement, minimal detectable change, standard error of kinematic curves) was calculated. Validity was assessed using 95% limits of agreement.

#### Results:

Intraclass correlation coefficient and coefficient of multiple correlation values ranged between 0.44-0.95 and 0.58-0.69, respectively, indicating moderate to high reliability. Values for the standard error of measurement (1-7 degrees) and curve standard deviation (3-6 degrees) indicated high reliability. Minimal detectable change values ranged from 3-8 degrees for head rotation and lateral flexion, but were between 11 and 20 degrees for flexion/extension. The large minimal detectable change values for flexion/extension were found in both systems, indicating similar reliability. The limits of agreement were  $< 10$  degrees for lateral flexion and rotation, but were  $> 15$  degrees for flexion/extension.

#### Conclusion/Key Practice Points:

- Reliability for the electromagnetic tracking system was high.
- Agreement between both systems for absolute angular values was high except for flexion/extension, where agreement was considered acceptable.
- The results support the use of electromagnetic tracking for exploring mechanisms underlying neck injuries in Rugby Union scrummaging with research in ecologically valid environments.

## VALIDITY AND RELIABILITY OF CHINESE VERSION OF DYSPNOEA-12 SCALE IN INDIVIDUALS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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R5-5, Meeting Room C4.2, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

Dyspnoea is a distressing symptom that impact daily living and functional performance of individuals with chronic obstructive pulmonary disease (COPD). Since dyspnoea is a complex and multidimensional experience, a psychometric scale that incorporates both physical and affective aspects would help us understand the severity of patients' dyspnoeic sensation. Dyspnoea-12 is a patient-reported scale that has been proven valid and reliable. This study aimed to develop a Chinese version of D-12 and test its validity and reliability.

### Design:

A cross-sectional design was adopted to examine the internal reliability and convergent validity of Chinese D-12.

### Methods:

A total of 33 subjects completed the study. These subjects were individuals with COPD recruited from North District Hospital, Hong Kong from April to October 2016. Participants were required to fill in four self-administered questionnaires, including Chinese version of Dyspnoea-12, St George Respiratory Questionnaire, COPD Assessment Test and 36-Item Short Form Health Survey.

### Results and Outcomes:

Mean D-12-C total score was  $7.61 \pm 8.81$  (mean  $\pm$  SD). Mean physical sub-score was  $4.21 \pm 4.99$  while mean affective sub-score was  $3.39 \pm 4.18$ . One patient (3%) achieved the highest score/ceiling effect (36/36) while six patients (18.2%) attained the lowest score/floor effect (0/36). High level of internal reliability was demonstrated in D-12-C total score (Cronbach's  $\alpha = 0.946$ ). D-12-C total score demonstrated strong correlation with the SGRQ score ( $r = 0.580$ ,  $p < 0.001$ ), CAT score ( $r = 0.616$ ,  $p < 0.001$ ) and SF36 score ( $r = -0.645$ ,  $p < 0.001$ ). D-12-C affective sub-score was found to have strong relationship with SF36 mental health sub-score ( $r = -0.689$ ,  $p < 0.001$ ).

### Conclusion:

Reliability and validity of D-12-C were found to be acceptable for Chinese-speaking individuals with COPD.

## RUMINATION, AN UPPER GASTROINTESTINAL DISORDER IN CHILDREN AND THE ROLE OF PHYSIOTHERAPY

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R5-5, Meeting Room C4.2, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

To investigate whether a physiotherapy-based treatment involving retraining diaphragmatic breathing would benefit this patient population.

### Design:

A summary of current literature relating to rumination was performed and informed treatment approach. A pilot study was conducted to assess and evaluate a physiotherapy based intervention for patients referred with rumination.

### Method:

The pilot study involved 4 paediatric patients who were referred from gastroenterology specialists with a primary diagnosis of rumination. All patients underwent baseline thoracic wall measurement followed by standardised treatment including education and diaphragmatic breathing retraining. Thoracic excursion

measures during tidal volume of the upper chest and lower abdominal wall provided an objective measure of chest wall movement and also biofeedback during treatment. Quantitative data comparisons were made between initial assessment and final treatment for episodes of rumination, thoracic excursion measures and observation of breathing pattern.

#### Results:

There was a reduction in episodes of rumination in all cases of the study population and resolution of rumination in three out of the four cases. Statistical comparison showed that all cases improved on diaphragmatic excursion after training (mean diaphragmatic excursion pre 0.075 cm; post 1.725cm). A mean of three sessions was required to re-train diaphragmatic breathing.

#### Conclusion/Key Practice Points:

- The results of the pilot study provide early evidence that diaphragmatic breathing is beneficial in reducing episodes of rumination
- This is the first treatment protocol identified for practitioners assessing and treating rumination.
- Further research is required to validate objective measures for diaphragmatic retraining and optimal interventions for functional gastrointestinal disorders.

### WHAT IS THE TOTAL IMPACT OF AN OBSTETRIC ANAL SPHINCTER INJURY AT AN AUSTRALIAN TERTIARY WOMEN'S HOSPITAL?

**Evans E<sup>1,2</sup>**, Falivene C<sup>1,2</sup>, Briffa K<sup>2</sup>, Thompson J<sup>2</sup>, Henry A<sup>3,4</sup>

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R5-5, Meeting Room C4.2, October 20, 2017, 10:35 AM - 11:35 AM

#### Aim:

The scope of this research was to assess the cumulative impact of sustaining an obstetric anal sphincter injury (OASI). Our primary objective was to collate the extent of symptomology existent beyond 12-month post-partum, observe the effect on future birth choices and open a discussion on current models of multidisciplinary care.

#### Design:

A retrospective cohort investigation of women affected by a third or fourth degree tear between October 2009 and May 2014.

#### Method:

Women completed a questionnaire covering: bowel symptomology, sexual function, life impact and future birth choices. A custom-created adverse composite outcome was used to determine the proportion of women with unacceptable levels of symptomology.

#### Results:

200 questionnaires were completed at a mean of 4 years post-OASI. 51% were identified as having an adverse composite outcome; with forceps birth ( $P=0.030$ ) or more severe grade of tear ( $P=0.029$ ) increasing the likelihood of an adverse outcome. Sequelae of the OASI impacting daily life was identified by 47%, with fecal incontinence affecting 19% of women, and dyspareunia reported by 64% of the 169 sexually-active women. 101 women had further children, with 48% reporting their delivery choices were impacted, 32% electing a caesarean and 26% shifting to private care. 80 women (40%) had not given birth again, and 29 (36%) of these indicated their OASI influenced this decision.

#### Conclusion/Key Practice Points:

- The total impact of an OASI to the woman affected is substantial.
- More than half experience ongoing symptoms and close to half report an impact on their future birth choices.

## THE OSWESTRY DISABILITY INDEX, CONFIRMATORY FACTOR ANALYSIS IN A SAMPLE OF 35,263 VERIFIES A ONE-FACTOR STRUCTURE BUT PRACTICALITY ISSUES REMAIN

**Gabel C<sup>1</sup>**, Cuaesta A<sup>3</sup>, Quan M<sup>4</sup>, Aghayev E<sup>5</sup>, Melloh M<sup>6</sup>

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R5-5, Meeting Room C4.2, October 20, 2017, 10:35 AM - 11:35 AM

### Aim/s:

To analyze the factor structure of the Oswestry Disability Index (ODI) in a large symptomatic low back pain (LBP) population using factor analysis (FA) through exploratory (EFA) and confirmatory (CFA) methods; for the full sample and across genders and consider practicality characteristics.

Design: retrospective analysis of baseline ODI LBP patient data from the international Spine Tango registry.

### Methods:

Spine Tango registry patients (n=35,263, 55.2% female; age 15-99, median 59 years), included degenerative disease (76.1%), non-degenerative spondylolisthesis (7.8%), pathological fracture (4.2%), repeat surgery (3.8%), deformity/traumatic fracture (2.7% each), tumor/infection (1% each) and other (<0.8%). Initial EFA provided a hypothetical one-factor model and a previously reported two-factor model of dynamic-activities (personal care, lifting, walking, sex and social) and static-activities (pain, sleep, standing, travelling and sitting). Subsequent CFA in three scenarios considered: the full sample and separate genders. Models were compared empirically for best fit.

### Results:

The EFA indicated a one-factor model accounted for 54% of total variance. The CFA analysis confirmed the one-factor model. Subgroup analyses by gender achieved good model fit for configural and partial metric invariance, but not scalar invariance. A possible two-construct model solution, as outlined by previous researchers with dynamic-activities and static-activities, was valid but not preferred.

### Conclusions/Key Practice Points:

- The ODI demonstrated a one-factor structure.
- A potential two-factor model of dynamic and static activity was determined but not appropriate.
- Use of a single-sumated score is psychometrically supported
- However reported practicality limitations highlight recommendations that clinicians and researchers shift towards newer, more sensitive and robustly developed instruments.

## CAN UPPER LIMB AND COGNITIVE MEASURES IDENTIFY CHANGE IN PATIENTS UNDERGOING A TAP TEST WITH IDIOPATHIC NORMAL PRESSURE HYDROCEPHALUS?

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R5-5, Meeting Room C4.2, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

To determine upper limb and cognitive outcome measures that can identify change in patients undergoing a lumbar puncture tap test (TT) diagnosed with idiopathic normal pressure hydrocephalus (iNPH).

### Design:

Prospective cohort study of 74 patients undergoing a TT for consideration of surgery for iNPH.

### Method:

Patients performed the Timed up and go cognition (TUG-C), 9-hole peg test and Montreal Cognitive Assessment (MoCA) before and after a TT. Patients who improved were categorised responders and offered

surgery. Patients who didn't improve were categorised non- responders. Sign-rank tests compared between groups differences with significance levels set at 0.05.

#### Results:

Median time to review post TT was 2 hours. Forty patients were categorised responders, 34 non-responders. For responders, the change in the TUG-C (-6.02 seconds  $p<0.01$ ) and MoCA (0.62 points  $p=0.02$ ) was significant. Only executive function and orientation sub scores of the MoCA showed significant changes (1 point each,  $p=0.03$ ). The 9 hole peg test change (4.33 seconds  $p=0.14$ ) was not significant. For non-responders changes of 0.22 points for the MoCA ( $p=0.51$ ), 0.3 seconds for TUG-C ( $p=0.63$ ) and 2.58 seconds for the 9 hole peg test ( $p=0.51$ ) were not significant.

#### Conclusion/ Key Practice Points

- The TUG-C can identify change in patients undergoing a TT and should be utilised to identify change.
- While statistically significant, change on the MoCA, of less than 1 point, cannot be considered clinically significant.
- The 9-hole peg test cannot be endorsed for identifying change resulting from a CSF TT.

### VALIDATING A BEDSIDE QUANTIFICATION OF BODY COMPOSITION IN ACUTE SPINAL CORD INJURY AND ITS RELEVANCE TO PREDICTING TOTAL ENERGY REQUIREMENTS

**Panisset M<sup>1</sup>**, El-Ansary D<sup>1</sup>, Desneves K<sup>2</sup>, Rodi <sup>2</sup>, Rafferty J<sup>2</sup>, Nunn A<sup>3</sup>, Brown D<sup>4</sup>, Ward L<sup>5</sup>, Davies P<sup>5</sup>, Galea M<sup>1</sup>

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R5-5, Meeting Room C4.2, October 20, 2017, 10:35 AM - 11:35 AM

Fat-free mass (FFM) accounts for 70-85% of the variance in resting metabolic rate in non-obese adults. Consistent evidence shows FFM can predicts metabolic rate in people spinal cord injury. Clinically practical objective measures of FFM are lacking. Bioimpedance-based regression equations have been developed to estimate FFM in other neurological conditions. However, these equations are population-specific and none have yet been validated for acute spinal cord injury.

#### Objectives:

1) Assess the validity of seven published bioimpedance analysis equations and dual energy x-ray absorptiometry (DXA) to measure fat-free mass (FFM) in acute traumatic spinal cord injury (SCI), using deuterium dilution as criterion reference. 2) determine the relationship between FFM and total energy expenditure in acute traumatic spinal cord injury.

#### Design:

Observational study. Twenty participants (18 male, 2 female) completed deuterium and BIA measurements 4-8 weeks post-injury. Thirteen also underwent DXA. Strength of relationships and agreement between measures were examined using Lin's concordance coefficient and Bland-Altman plots, respectively.

#### Results:

Median time since injury was 41 days. DXA underestimated FFM by 2.9% with wide dispersion ( $\pm 11.5\%$ ). Bioimpedance demonstrated low bias (+600g) with a moderate dispersion ( $\pm 5.2\text{kg}$ ). FFM correlated with total energy expenditure ( $r=0.59$ ,  $p=0.0066$ ), predicting 35% of the variance.

#### Key Practice Points:

- Bioimpedance measurement provides a well-tolerated and valid quantification of FFM for group comparisons
- FFM from bioimpedance helps predict total energy expenditure, providing a novel objective measure for nutritional management of acute SCI
- Further research is needed to validate BIA to assess individuals and monitor longitudinal changes in body composition.

## FEMALES WITH PATELLOFEMORAL PAIN SHOW SIGNS OF IMPAIRED LOAD ABSORPTION AND POWER DURING A SINGLE-LEGGED DROP VERTICAL JUMP

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R5-5, Meeting Room C4.2, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

Compare vertical ground reaction force (V-GRF) during single-legged drop vertical jumps between females with and without patellofemoral pain (PFP); and kinematic patterns of knee flexion/extension at different phases of the task.

### Design:

Cross-sectional study.

### Method:

28 females with PFP (age  $24.2 \pm 4.1$  years; pain onset  $4.5 \pm 3.9$  years) and 28 healthy females (age  $22.9 \pm 2.7$  years) dropped forward onto a force plate from a 31cm high box, and upon landing, jumped vertically as high and quickly as possible. Kinematics (Qualisys) and V-GRF (Bertec 4060-08 force plate) were captured during from five trials. Independent t-tests compared groups for peak V-GRF; and knee range of motion (ROM) during deceleration (landing to peak knee flexion) and acceleration (peak knee flexion to take-off) phases.

### Results:

Compared to healthy controls, the PFP group landed with 6% greater peak V-GRF (1.8 N/kg, 95% CI 0.1 to 5.6;  $p = 0.04$ ), and 10% less knee ROM during the deceleration phase ( $-5.0^\circ$ ; 95% CI  $-9.8$  to  $-0.2$ ;  $p = 0.04$ ); and generated 19% less knee extension ROM during the acceleration phase ( $-11.4^\circ$ ; 95% CI  $-17.8$  to  $-5.0$ ;  $p = 0.001$ ).

### Conclusion/Key Practice Points:

- Greater V-GRF and reduced knee ROM during landing, and reduced knee extension ROM during acceleration of a jump in females with PFP may indicate an impaired capacity to absorb load and generate power respectively.
- Impaired capacity to absorb load and generate power through the knee should be considered and addressed where appropriate in athletes with PFP.

## PATIENT ADHERENCE TO AN EXERCISE PROGRAM FOR CHRONIC LOW BACK PAIN MEASURED BY PATIENT-REPORT, PHYSIOTHERAPIST PERCEPTION AND OBSERVATIONAL DATA

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R5-5, Meeting Room C4.2, October 20, 2017, 10:35 AM - 11:35 AM

### Objectives:

To compare patient-reported adherence levels with physiotherapists' perceptions of patient adherence; and to explore the proportion of patients who could accurately recall and demonstrate the exercises contained within their prescribed exercise program for chronic low back pain (CLBP).

### Design:

Cross-sectional observational study conducted within six Australian physiotherapy private practices.

### Methods:

Patients ( $n=61$ ) included those attending for a follow-up consultation with a participating physiotherapist ( $n=15$ ) at a consenting practice ( $n=6$ ) who had been prescribed an exercise program for CLBP. Patients were asked to self-report their level of adherence to the exercise program which was then compared to their physiotherapist's perception of adherence. Patients were also asked to recall and demonstrate the exercise program to an independent researcher, which was compared to the prescribed program.

#### Results:

The number of patients who self-reported as adherent was 24 (39%; 95% CI: 27-52%) compared with 10 patients (16%; 95% CI: 8-28%) who were perceived by their physiotherapist as adherent. However, only nine patients (15%, 95% CI: 7-26%) were able to accurately recall and demonstrate their prescribed exercise program. Of these nine patients, eight self-reported as adherent; while four were perceived by the physiotherapist as adherent.

#### Conclusion/ Key Practice Points:

- Patient adherence to exercise programs for CLBP is low irrespective of the measure used
- Exercise non-adherence can have a negative impact on patient outcomes
- There is a need to develop an accurate, robust, multifaceted measure of adherence which should include observational data.

#### WHICH ITEMS OF THE LACEY ASSESSMENT OF PRETERM INFANTS (LAPI) BEST PREDICT THE CLASSIFICATION OF "SUSPECT DEVELOPMENT"

**Spithill A<sup>1</sup>**, Dwyer G<sup>1</sup>, Carbone N<sup>2</sup>, Lucas B<sup>3</sup>

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R5-5, Meeting Room C4.2, October 20, 2017, 10:35 AM - 11:35 AM

#### Aim:

To determine which of the 20 individually scored items (within the LAPI subsections of "Motor", "Tone" and "Atypical Responses") best predict the classification of suspect development.

#### Design:

A retrospective cohort study of preterm infants assessed in a Sydney-based NICU, between 2009-2012, for developmental status using the LAPI (2009 version).

#### Method:

179 (92 male) preterm infants  $\leq 36$  weeks gestational age (mean 30.4 weeks) with complete assessment performed after 32 weeks post-menstrual age (mean 36 weeks) were included. Data for each infant were independently audited for accuracy.

Pearson Chi-square analysis was used to determine which items had a significant correlation with suspect development (i.e.  $p < 0.05$ ). Non-significant association items were removed from further analyses. Forward stepwise logistic regression was employed to identify which test items best-predicted suspect development classification.

#### Results:

Four items (Head Protective Side Turning, Weight Bearing, Head Lag and Tone Asymmetries) were excluded with non-significant correlations. The remaining 16 items were modelled against the binary outcomes of "usual" or "suspect" development. The items within the subsection of Atypical Responses of (1) Tone Variation, (2) Spontaneous Movement, and (3) Coarse Jitters most strongly predicted suspect development (Nagelkerke  $R^2 = .715$ ,  $p < .001$ ).

#### Conclusion/ Key Practice Points:

- The LAPIs most predictive items for suspect development are (1) Tone Variation, (2) Spontaneous Movement, and (3) Coarse Jitters
- Potential exists to revise and modify the tool to reduce administration time, however further studies would be required to determine if the predictive validity to identify abnormal development (including cerebral palsy) is maintained.

## EXERCISE-INDUCED OXYGEN DESATURATION AND PERCEIVED BREATHLESSNESS IN 6-MINUTE WALK TEST AND GROCERY SHELVING TASK IN PATIENTS WITH COPD

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R5-5, Meeting Room C4.2, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

To compare changes in exercise-induced oxygen desaturation and perceived breathlessness during 6-minute walk test with those achieved during the grocery shelving task following pulmonary rehabilitation.

### Design:

Retrospective cohort study consisting of a medical record audit of pulmonary rehabilitation participants from August 2014 to August 2016.

### Method:

Participants completed eight weeks of pulmonary rehabilitation consisting of both upper and lower limb exercise. Within-subject comparisons of pre- and post-cases using a two-tailed paired t-test or non-parametric Wilcoxon-signed ranks test were analysed.

### Outcome measures:

The degree of change in exercise-induced oxygen desaturation was recorded from the SpO<sub>2</sub> maximum and minimum achieved in 6-minute walk test and grocery shelving task using forehead or finger oximetry. The degree of change in perceived breathlessness was recorded from the modified BORG scale maximum and minimum achieved in 6-minute walk test and grocery shelving task.

### Results:

Of 88 participants, there was no significant change in exercise-induced oxygen desaturation for 6-minute walk test ( $\Delta\text{SpO}_2\text{Forehead} = 0.5\%$ ,  $p = 0.20$ ;  $\Delta\text{SpO}_2\text{Finger} = 0.8\%$ ,  $p = 0.12$ ) and in the grocery shelving task, it significantly reduced ( $\Delta\text{SpO}_2\text{Forehead} = 1.0\%$ ,  $p = 0.00$ ). Perceived breathlessness was significantly reduced in both 6-minute walk test ( $\Delta 0.3$ ,  $p = 0.02$ ) and grocery shelving task ( $\Delta 0.2$ ,  $p = 0.03$ ).

### Conclusion/Key Practice Points:

- In our sample, pulmonary rehabilitation resulted in a reduction in exercise-induced oxygen desaturation during upper limb activity with no change during lower limb exercise.
- Pulmonary rehabilitation targeted at alleviating upper limb breathlessness may be more beneficial to these patients.

## WHAT IS PREVALENCE OF IMAGING DEFINED INTRA-ARTICULAR HIP PATHOLOGIES IN PEOPLE WITH AND WITHOUT SYMPTOMS? A SYSTEMATIC REVIEW AND META-ANALYSIS

**Heerey J<sup>1</sup>**, Kemp J<sup>1</sup>, Mosler A<sup>2</sup>, Jones D<sup>1</sup>, Pizzari T<sup>1</sup>, Souza R<sup>3</sup>, Crossley K<sup>1</sup>

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<sup>3</sup>University of California, San Francisco, USA

SPA5A, Meeting Room C4.9, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

The aim of this review was: to determine the prevalence of intra-articular hip pathologies in individuals with and without symptoms; to evaluate the prevalence of intra-articular hip pathologies based on athletic level and sex.

### Design:

Systematic review with meta-analysis.

### Methods:

MEDLINE, EMBASE, CINAHL, Pubmed, SportDiscus, Cochrane library and Scopus were searched in February 2017 for studies with a primary aim of investigating the prevalence of intra-articular hip pathologies using MRI, MRA or CT. Two independent reviewers undertook the electronic search, quality appraisal and

data extraction. Meta-analysis was performed when studies were deemed homogenous, with a strength of evidence assigned to pooled results.

#### Results:

Limited evidence revealed a labral tear prevalence of 62% in symptomatic individuals, with moderate evidence identifying a labral tear prevalence of 56% in asymptomatic individuals. Limited evidence demonstrated a cartilage defect prevalence of 64% in symptomatic individuals, compared to 13% of asymptomatic individuals. Bone marrow lesions and ligamentum teres tears were more prevalent in individuals with symptoms. Herniation pits and paralabral cysts were equally prevalent in those with and without clinical symptoms. Cartilage defects and labral tears were observed more often in athletes and men.

#### Conclusion

- The prevalence of intra-articular hip pathologies appears to be higher in symptomatic individuals
- Imaging defined intra-articular hip pathologies are consistently seen in asymptomatic individuals, highlighting a potential discordant relationship with pathology and symptoms.

#### HIP AND THIGH MUSCLE SIZE, COMPOSITION AND INFLAMMATORY MARKERS IN PEOPLE WITH ARTICULAR HIP PATHOLOGY: A SYSTEMATIC REVIEW WITH META-ANALYSIS

**Lawrenson P<sup>2</sup>**, Crossley K<sup>1</sup>, Croft K<sup>2</sup>, Hodges P<sup>2</sup>, Vicenzino B<sup>2</sup>, James G<sup>2</sup>, Semciw A<sup>2,1</sup>

<sup>1</sup>La Trobe University, Bundoora, Australia, <sup>2</sup>University of Queensland, St Lucia, Australia

SPA5A, Meeting Room C4.9, October 20, 2017, 10:35 AM - 11:35 AM

#### Aim:

Investigate differences in hip and thigh muscle size, structure, composition and inflammatory markers between people with articular hip pathology and matched peers

#### Design:

Systematic review with meta-analysis

#### Methods:

A systematic literature search was performed across 5 databases, using three main concepts; pathology (osteoarthritis); location (hip muscles); outcome (e.g. muscle volume). Included studies addressed non-inflammatory articular pathology, examined specific isolated muscles and used recognised measures of size, and histopathology. Standardised mean differences were reported and data was pooled, using a random effects model.

#### Results:

Twenty studies were included with 500 participants (151 men) exhibiting articular pathology, and 378 controls (185 men). Data was sub-grouped by pathology (osteoarthritis (n=15), femoroacetabular impingement (n=1); acetabular labral pathology (n=1); Perthes disease (n=1); Dysplasia (n=1)). Data could only be pooled for hip osteoarthritis (2 studies). There was no significant difference in muscle volume between symptomatic hip osteoarthritis and controls for gluteus maximus (SMD 0.05 [-0.47, 0.58]), gluteus medius (SMD 0.14 [-0.39, 0.66]), gluteus minimus (SMD -0.21 [-0.74, 0.32]). Trend for larger tensor fascia latae (TFL) in people with hip osteoarthritis (SMD 0.49 [-0.05, 1.02]). Further pooling of data examining size, composition and inflammatory markers in other muscles and pathologies was impeded by high heterogeneity and limited studies.

#### Conclusion:

- Trend for larger TFL in people with hip osteoarthritis compared with controls. This may reflect a compensatory strategy for smaller deep hip muscles.

## WHAT IS THE LOCATION AND DISTRIBUTION OF PAIN IN FEMOROACETABULAR IMPINGEMENT USING A NOVEL AND QUANTITATIVE METHOD?

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SPA5A, Meeting Room C4.9, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

To describe the location and distribution of pain in adults with symptomatic FAI, using a digital pain platform.

### Design:

Cross-sectional

### Methods:

Twenty-five adults (13 female), aged 33.5 (8.7) years with symptomatic FAI drew their pain on a high resolution male or female body chart displayed on a tablet computer. Pain area (expressed as pixels) was extracted using the Navigate Pain software (Aalborg University), which directly quantifies pain area, distribution and location. Laterality (uni- vs. bilateral) and symmetrical presentation of pain were reported. Between group differences were evaluated with Wilcoxon signed rank test.

### Results:

In all 25 FAI patients, pain was reported in the anterior hip region, whereas 7/13 women and 5/12 men also reported pain posteriorly. Evaluation of the anterior hip and groin region revealed no difference in total area of pain between right ( $6792 \pm 1065$ ) and left ( $6626 \pm 1202$ ) sides. However, total pain over the posterior hip was less for the left ( $5171 \pm 1044$ ) when compared to the right ( $8141 \pm 1422$ ) side ( $Z = -2.1$ ,  $p = 0.036$ ). For those presenting with bilateral pain, there was no difference in the total (anterior + posterior) pain area between the most severe and less severe side ( $Z = -0.471$ ,  $p = 0.638$ ).

### Conclusion:

- In individuals with symptomatic FAI pain distribution was highly variable
- The groin area in men and the anterior hip in females were the most commonly indicated areas of pain.

## BIOMECHANICAL IMPAIRMENTS IN FEMOROACETABULAR IMPINGEMENT: A SYSTEMATIC REVIEW AND META-ANALYSIS

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SPA5A, Meeting Room C4.9, October 20, 2017, 10:35 AM - 11:35 AM

### Aim:

Compare pelvic and hip joint biomechanics during functional daily living tasks between people with and without femoroacetabular impingement (FAI).

### Design:

Systematic Review and meta-analysis

### Methods:

A systematic search of the literature was conducted around two main concepts; FAI and biomechanics. Studies were included if they compared the biomechanics of everyday tasks in people with and without (control) FAI, using three-dimensional motion capture devices. Relevant studies were assessed for methodological quality and standardised mean differences were pooled using a random effects model.

### Results:

Thirteen studies were included with 205 symptomatic participants (151 men), age range 24.1-40.1 years and 236 controls (158 men) age range 27.1-43.2 years. Methodological quality ranged from low to moderate quality. People with FAI walked with lower peak hip extension angle (SMD -0.40, 95% CI -0.71 to -0.09;  $I^2 = 0\%$   $p = 0.60$ ), lower total sagittal plane ROM, (-0.51, -0.93 to -0.08;  $I^2 = 0\%$   $p = 0.66$ ), lower peak hip internal

rotation angle (-0.67 -1.19 to -0.16; I<sup>2</sup>= 47% p=0.15), and lower peak external rotation joint torque (-0.71, -1.07 to -0.35; I<sup>2</sup>= 0% p=0.82). People with FAI squatted to a lesser depth compared with controls (0.92, 0.46 to 1.38; I<sup>2</sup>= 0%, p=0.77), with no difference in peak hip flexion.

**Conclusion:**

- Moderate to large biomechanical differences exist during gait and deep squat in people with FAI compared with matched peers.
- This information may provide a target for future treatment strategies and interventions for the condition.

## MANIFESTATIONS OF PERIPHERAL AND CENTRAL SENSITIZATION ACROSS DIFFERENT PAINFUL KNEE DISORDERS: A SYSTEMATIC REVIEW AND META-ANALYSIS

**De Oliveira Silva D<sup>1,2</sup>**, Barton C<sup>1</sup>, Petersen K<sup>3</sup>, Azevedo F<sup>2</sup>, Rathleff M<sup>3</sup>

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SPA5B, Meeting Room C4.10, October 20, 2017, 10:35 AM - 11:35 AM

**Aim:**

To evaluate and synthesise the published research investigating manifestations of peripheral and central sensitization in all painful knee disorders and to evaluate if the manifestations of peripheral and central sensitization change in response to treatment.

**Design:**

Systematic review.

**Method:**

Medline, Embase, CINAHL, Web of Science, Sportsdiscus and Cochrane Central were searched in February 2017 for studies investigating between-group differences (knee pain versus pain-free controls), or the effect of treatment on manifestations of pain sensitization. Two reviewers independently assessed studies for inclusion and quality, and data were synthesised using meta-analysis and pre-determined levels of evidence.

**Results:**

The overall findings from our systematic review and meta-analysis provide evidence of altered central pain processing in people with knee osteoarthritis (strong evidence), people with patellofemoral pain (moderate evidence), and post-meniscectomy patients (very limited evidence). Conflicting evidence exists in patellar tendinopathy. Findings also demonstrate that manifestations of sensitization may be amenable through exercise therapy, mobilization, pharmacological treatment, and surgical intervention.

**Conclusion/ Key Practice Points:**

- Manifestations of sensitization is present in people with knee osteoarthritis, patellofemoral pain and post meniscectomy pain.
- Both mechanical and non-mechanical treatments were found to positively influence manifestations of sensitization in people with knee osteoarthritis and patellofemoral pain.
- Further research is needed to understand the influence of manifestations of sensitization on prognosis of painful knee disorders.

## RETURN TO SPORT FOLLOWING NON-SURGICAL MANAGEMENT FOR INDIVIDUALS WITH AN ANTERIOR CRUCIATE LIGAMENT RUPTURE

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SPA5B, Meeting Room C4.10, October 20, 2017, 10:35 AM - 11:35 AM

**Aim:**

To establish the sporting level achieved by individuals with conservatively managed anterior cruciate ligament ruptures, 14 years (mean) post injury.

Design:  
Cross-sectional cohort study

Method:  
Fifty-two patients with anterior cruciate ligament deficiency, diagnosed by a knee surgeon and on imaging, were followed-up 14 years ( $\pm 7$ ) post injury. Mean-aged 42 years, 22 patients were females and 32 males, 35 had meniscal injuries. Assessment included: Return to sport measured on a 5-point scale; antero-posterior stability measured using the KT1000 arthrometer, quadriceps and hamstring strength measured on the Cybex II, and osteoarthritis assessed on four x-rays.

Results:  
Six patients had not returned to sport, ten returned to safe sports namely swimming, cycling, walking, four returned to running and 16 to solo sports involving twisting namely golf, surfing and skiing. Twelve patients had returned to team sports including hockey, cricket, rugby at a recreational level and six to similar team sports at a competitive level. There was a 39% increase in anterior tibial translation comparing injured to uninjured sides, an 8% loss of quadriceps strength and a 2% loss of hamstring strength. Thirty-four patients (63%) patients had developed early tibiofemoral OA and 23(43%) had developed patellofemoral OA.

Conclusions/Key Practice Points:

- Most individuals with a ruptured anterior cruciate ligament treated without reconstruction, continue to lead an active sporting life.
- Despite the loss of strength and stability and the high incidence of early osteoarthritis in this cohort, 88% still played sport.
- One third played team sports.
- Most had modified their sport and sporting goals.

#### THE DISTRIBUTION OF PASSIVE STIFFNESS WITHIN THE PATELLAR TENDON VARIES WITH KNEE FLEXION ANGLE.

**Coombes B<sup>1</sup>**, Ziegenfuss B<sup>1</sup>, David M<sup>1</sup>, Badya R<sup>1</sup>, Van den Hoorn W<sup>1</sup>, Hug F<sup>2</sup>, Tucker K<sup>1</sup>

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SPA5B, Meeting Room C4.10, October 20, 2017, 10:35 AM - 11:35 AM

Aim:  
To investigate the distribution of passive stiffness within the anterior and posterior portions of the proximal patellar tendon and between 3 of the 4 quadriceps muscles in different knee positions using novel shear wave elastography.

Design:  
Cross-sectional study

Methods:  
Nineteen young, healthy participants underwent testing of their non-dominant leg. Isokinetic dynamometry was used to passively position the leg in 25,40,55,70 and 85° flexion for capture of elastography images. Electromyography verified the quadriceps muscles were relaxed throughout testing. MATLAB software was used to extract the shear wave velocity (SWV) in m/s for each region of interest as a measure of tissue stiffness. Mixed-effects multi-level regression modelling was used to test the effects of joint angle, tendon region (or muscle) and interaction (significance set at  $p < 0.05$ ).

Results:  
SWV of tendon and muscle increased with knee flexion ( $p < 0.001$ ). The posterior portion of the proximal patellar tendon had lower SWV than the anterior portion at 70° (MD -0.60, 95% CI -0.93 to -0.27,  $p < 0.001$ ) and 85° (MD -0.97, -1.3 to -0.64,  $p < 0.001$ ), but not 25, 40 or 55°. Muscle SWV for vastus medialis and vastus lateralis were significantly different at 55, 70 and 85° ( $p < 0.001$ ), but not 25 or 40°. Rectus femoris had lower SWV at all angles ( $p < 0.021$ ).

#### Conclusion/Key Practice Points:

- In knee flexion  $\geq 70^\circ$ , passive stiffness is unevenly distributed within the proximal patellar tendon.
- Stress-shielding of the posterior portions of the proximal patellar tendon may explain the prevalence of pathology at this location.

#### SPORTING OPPORTUNITIES FOR PEOPLE WITH PHYSICAL DISABILITIES: MIXED METHODS STUDY OF WEB-BASED SEARCHES AND SPORT PROVIDER INTERVIEWS

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SPA5B, Meeting Room C4.10, October 20, 2017, 10:35 AM - 11:35 AM

#### Aims:

To assess web-based information about sport opportunities for people with physical disabilities; to explore barriers and potential solutions to offering such opportunities from the perspective of sport organisations.

#### Design:

Mixed method study conducted in two stages.

#### Methods:

We focused on 26 high participation sports. Stage One involved conducting web-based searches of sporting organisations at national (Australia), state (NSW) and local club level and auditing the websites to identify the mention of sport opportunities for people with disabilities. Stage Two involved conducting interviews with 25 sport providers identified from Stage One to discuss barriers and potential solutions to providing these opportunities. Interview data were transcribed verbatim and thematically analysed.

#### Results:

Across 26 sports, 138 organisations (43 national, 33 state, 62 local clubs) were identified. Information about sport opportunities for people with disabilities decreased from national (86% of websites mentioned such opportunities) to state (76%) to club (37%) level. Barriers identified to providing sport opportunities for people with disabilities included getting the word out, lack of coordination between organisations and people's attitudes. Potential solutions included fostering working partnerships and increasing understanding.

#### Conclusion/Key Practice Points:

- Greater awareness and acceptance from society of the role of sport for people with disabilities is needed.
- Finding information on sport opportunities for people with disabilities is currently challenging with different terminology and different quantities and location of information between and within sports.
- Sporting organisations should work with key stakeholders to address this problem to reduce this barrier to sport participation for people with physical disabilities.

#### END STAGE IN ROWING: CONSIDERATIONS FOR RETURN TO SPORT WITH OVERUSE INJURY

Wilkie K<sup>1</sup>

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SPA5C, Meeting Room C4.5, October 20, 2017, 10:35 AM - 11:35 AM

The three most common injuries in rowing are low back pain, chest wall pain and forearm pain (Thornton et al 2016). All injuries are overuse in nature and all require a period of rest from on water and / or ergometer training. This presentation will explore considerations for return to sport when a period of unloading has occurred and the importance of load management in guiding the decision making process. Each of the three most common overuse injuries will be discussed with specific considerations for increasing both local load on the injured tissue and global training load with specific attention to the time of the season that the injury occurred.

#### Key Practice Points:

- Participants will become familiar with the three most common rowing injuries and the specific considerations for end stage rehabilitation.
- This presentation will also explore how a multi-disciplinary approach for end stage conditioning can be used where the Physiotherapist, Coach, Athlete, Strength and Conditioning Coach, Sports Dietician and Exercise Physiologist all play a role in planning a full return to training.

### END-STAGE HIGH-LEVEL STRENGTHENING FOR HIP/GROIN INJURIES

**Charlton P<sup>1</sup>**

<sup>1</sup>*Australian Institute of Sport, Canberra, Australia*

SPA5C, Meeting Room C4.5, October 20, 2017, 10:35 AM - 11:35 AM

#### Background:

Physiotherapists form an essential part of injury rehabilitation. Early-stage rehabilitation progressions are incorporated in undergraduate education and more thoroughly in post-graduate education. End-stage rehabilitation however is often an afterthought, especially with regard to return to competition, despite the fact that physiotherapists are commonly charged with this responsibility. If an athlete is to have the best chance avoiding complications that might arise due to the initial injury as well as preventing re-injury or subsequent injury, rehabilitation efforts must adequately match the demands of competition. Careful planning of end stage rehabilitation, including appropriate strengthening and re-conditioning will assist successful return to play.

#### Objectives:

- To understand the demands of competition with respect the potential gaps between rehabilitation and competition
- To understand the key factors for designing end-stage rehabilitation programs and return to competition
- To understand the reasons why rehabilitation might fail

#### Key Practice Points:

- Participants will be able to identify key factors for end-stage rehabilitation relevant to the sport
- Participants will be able to apply strategies for developing end-stage rehabilitation programs.

### CLINICAL REASONING IN COMPLEX PELVIC PAIN

**Sherburn M<sup>1</sup>**, Andrews A<sup>2</sup>, Frawley H<sup>3</sup>, McGlashan G<sup>4</sup>, Morrison S<sup>5</sup>, Neumann P<sup>6</sup>, Oldfield E<sup>7</sup>, Thompson J<sup>8</sup>

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WMPH5, Meeting Room C4.4, October 20, 2017, 10:35 AM - 11:35 AM

#### Background:

Clinical reasoning is the cognitive process that underpins diagnosis and management of all patients. It becomes automated as the clinician becomes more skilled. Clinical reasoning can be defined as the ability to integrate and apply knowledge, weigh evidence, reflect on the process and arrive at a diagnosis or treatment plan. Clinical reasoning skills improve with practice and can be taught within a theoretical framework which provides a logical understanding of the process for clinicians at all stages of skill development. However there is little published guidance on clinical reasoning for a physiotherapist to use when managing a patient with complex pelvic pain.

#### Aims:

To improve participants' knowledge and skills in clinical reasoning in complex pelvic pain clinical cases.  
To provide a theoretical framework in which to practice and test clinical reasoning skills.

#### Approach:

Participants will be introduced to a clinical reasoning theoretical framework. A complex pelvic pain clinical case will be presented in stages (initial symptoms, hypothesis development, refining hypotheses, objective examination, and treatment strategies) and worked through using a series of presentations from specialist physiotherapists followed by group work in triads, then whole group summation. Learning materials will be provided (case study, clinical reasoning framework, references).

#### Conclusion / Key Practice Points:

- Participants will understand the process involved in clinical reasoning and be able to apply this in their clinics.
- Participants will have an opportunity to reflect on their clinical reasoning skills.
- Participants will be able to more effectively manage complex pelvic pain patients in their clinics.

### RISK FACTORS FOR VULVODYNIA: A SYSTEMATIC REVIEW

**Graetz H<sup>1</sup>**, White A<sup>2</sup>, Frawley H<sup>3,4</sup>

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WMPH5, Meeting Room C4.4, October 20, 2017, 10:35 AM - 11:35 AM

#### Aim:

To systematically review the literature on the risk factors for vulvodynia.

#### Design:

A systematic review was conducted as per Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

#### Methods:

The search was undertaken for risk factors for vulvodynia; across PubMed, Ovid, ProQuest and Science Direct databases. The methodological quality was assessed by two independent reviewers using standardised criteria before analysis of main results.

#### Results:

18 observational studies covering 11 different cohorts, including 3 cohort, 4 cross-sectional and 11 case control studies fulfilled inclusion criteria. Fifty-seven factors were assessed across three different domains: gynaecological (19), medical (24) and psychosocial (14). Reported incidence of vulvodynia was between 3/100 and 11/100. Factors consistently identified as contributing to risk of vulvodynia included ever use, duration of use greater than 2-6 years and younger than 17 years of age at commencement of oral contraceptive pill; combination or single reports of urogenital infection and comorbid pain conditions; while anxiety and a childhood experience of severe abuse were psychosocial factors highly linked with vulvodynia. The predictive ability and degree of risk was difficult to categorically determine because of confounders; heterogeneity of populations and methodologies; and a lack of cohort studies.

#### Conclusion/Key Practice Points:

- This review identifies many gynaecological, medical and psychosocial risk factors that may contribute in varying degrees to vulvodynia.
- With recent investigations increasing the scope of aetiological considerations for vulvodynia and updated vulvar pain terminology, this review may further improve understanding of aetiology and risk and possibly guide efforts in preventing vulvodynia.

## DOES BLINDING MODERATE TREATMENT EFFECT? META-ANALYSES OF DRY NEEDLING TRIALS

**Braithwaite F<sup>1</sup>**, Walters J<sup>1</sup>, Li K<sup>1</sup>, McEvoy M<sup>1</sup>

<sup>1</sup>*The Sansom Institute for Health Research, University of South Australia, Adelaide, Australia*

ADN6, Meeting Room C4.6, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

To determine whether in dry needling trials, blinding status or blinding effectiveness moderates treatment effect on pain.

### Design:

Systematic review with meta-analyses.

### Method:

Databases were searched from inception to February 2016 for trials of true versus sham dry needling. Two independent reviewers performed screening, data extraction, and critical appraisal. Pain outcomes were pooled according to trial blinding status (adequate versus inadequate, based on four blinding domains from the Cochrane risk of bias tool) and blinding effectiveness (participant belief about group allocation relative to actual group allocation).

### Results:

The search identified 4894 individual publications with 27 trials eligible for inclusion, and 23 included in meta-analyses. In 19 trials risk of bias was high. Inadequately blinded trials demonstrated inflated treatment effects in favour of true dry needling compared with adequately blinded trials in the short- and long-term, but not immediately post-treatment. In the long-term, this effect was statistically significant ( $p = 0.006$ ). In 10 trials where blinding was assessed, there were no significant differences in pain outcomes based on blinding effectiveness.

### Conclusion:

Trials with inadequate blinding demonstrated a bias in favour of true dry needling. Small sample sizes, clinical heterogeneity, and limited or incomplete reporting of blinding assessments resulted in insufficient data to quantify a moderating effect of unblinding on dry needling treatment effect.

### Key Practice Points:

- Future dry needling trials should be adequately blinded
- Evaluation of blinding in clinical trials should be undertaken
- Data about perceived group allocation will enable quantification of moderating effects of blinding effectiveness.

## APPLICATION OF TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION ON ACUPOINTS (ACU-TENS) MAY IMPROVE RUNNING ECONOMY IN RECREATIONAL RUNNERS: A PILOT STUDY

**Chong J<sup>1</sup>**, Cheung R<sup>1</sup>, Wong D<sup>2</sup>, Tio O<sup>1</sup>, Ngai S<sup>1</sup>

<sup>1</sup>*Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, , Hong Kong,* <sup>2</sup>*Sport Sciences Research Center, Shandong Sport University, Jinan, , China*

ADN6, Meeting Room C4.6, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

To determine the effect of Acu-TENS on enhancing running economy during maximal level of exercise

Design: Double-blinded crossover randomized-controlled-trial

### Method:

Seven male recreational runners were randomly assigned to receive either Acu-TENS [TENS on acupoints: Lieque(LU-7) and Dingchuan(EX-B1)] or Placebo-TENS (Acu-TENS with circuit disconnected) in their first session while receiving the other one on the subsequent session, with a week apart as washout. On each visit, subjects received Acu-TENS/ Placebo-TENS for 45mins, followed by a maximal stress test using Bruce Protocol until reaching termination criteria. Oxygen consumption, heart rate and blood pressure were

measured during the exercise. Paired t-test was used to examine if significant difference existed between Acu-TENS and Placebo-TENS.

#### Results:

Participants reached 95% maximal heart rate at the end of exercise test in both visits. Under similar workload, participants receiving Acu-TENS before running demonstrated a trend of longer exercise duration by  $30 \pm 48$  seconds ( $p=0.13$ ), a lowered level of maximal oxygen consumption by  $3 \pm 10$  ml/min/kg ( $p=0.51$ ), lowered level of systolic ( $6 \pm 18$ ,  $p=0.41$ ) and diastolic blood pressure ( $5 \pm 7$ ,  $p=0.096$ ) when compared to the session receiving Placebo-TENS, though statistically insignificant. Sample size calculation based on these data with  $\alpha$  set at 0.05 and power of 0.8, at least 50 participants will be needed to detect the effect of Acu-TENS on running economy.

#### Conclusion:

Acu-TENS administered prior running may enhance running economy as reflected by a trend of lowered level of maximal oxygen consumption and reduced level of hemodynamic challenge under the similar exercise challenge. However, further study with larger sample size is warranted.

### MEASURING THE IMPACT OF PAINFUL MYOFASCIAL TRIGGER POINTS ON PHYSICAL FINDINGS, HEALTH STATUS, MOOD AND QUALITY OF LIFE: IMPLICATIONS FOR ASSESSMENT AND DRY NEEDLING TREATMENT

**Shah J<sup>1</sup>**

<sup>1</sup>Bethesda MD, Bethesda, United States

ADN6, Meeting Room C4.6, October 20, 2017, 11:40 AM - 12:40 PM

There is no accepted standard approach to the evaluation of myofascial pain syndrome (MPS), and its full impact on life activity and function is not fully understood. Many of the measures of pain currently in use are insensitive to change, particularly after treatments, including dry needling (DN).

A combination of objective measures and self-reports (SF-36, Profile of Mood States, Brief Pain Inventory, Oswestry Disability Scale) is able to successfully distinguish subjects with cervical pain due to active myofascial trigger points (MTrPs) in the upper trapezius from subjects with no pain.

Compared to pain-free controls, individuals with cervical pain secondary to active MTrPs evince significantly lower pain pressure threshold (PPT); poorer health status; more depression, fatigue, tension, confusion, and mood disturbance; greater disability; more restriction in side-bending; and more latent MTrPs.

DN of MTrPs can improve visual analog scale and the Brief Pain Inventory, increase the PPT of the region treated, and improve SF-36 quality of life scores for pain, mental health, and physical function. It is likely that earlier DN intervention, aimed at significant pain reduction, will be associated with a sustained clinical response.

Studies support the emerging view that what has long been considered a “local” pain syndrome actually has a broader impact beyond the active MTrP and has significant associations with mood and health-related quality of life and function. Recent findings compel us to look at the phenomena of MPS and MTrPs as a type of spectrum disorder of sensitization that manifests clinically by varying symptoms and signs.

### EXERCISE & KNEE OSTEOARTHRITIS: MAXIMISING PATIENT ADHERENCE TO IMPROVE PATIENT OUTCOMES

**Hinman R**

<sup>1</sup>NHMRC Centre of Research Excellence in Translational Research in Musculoskeletal Pain, Centre for Health, Exercise & Sports Medicine, The University of Melbourne, , Australia

AG6, Meeting Room C3.5, October 20, 2017, 11:40 AM - 12:40 PM

#### Outline of presentation:

Exercise is the cornerstone of osteoarthritis management. Clinical guidelines advocate exercise as a core treatment for people with osteoarthritis, irrespective of age, comorbidity, pain severity or disability. Evidence shows that land and aquatic exercise can reduce pain and disability, and improve quality of life, with fewer

side effects than common pharmacological interventions. However for exercise to be effective, behaviour change is needed to maintain adherence to exercise and physical activity programmes. Initiating and maintaining participation in exercise can be very difficult for many people with osteoarthritis. This session will review the evidence showing the effectiveness of exercise in people with knee osteoarthritis. Using behaviour change theory, barriers and facilitators to exercise participation in this population will be discussed, and potential strategies for maximising patient adherence will be highlighted. Current research evidence evaluating the effectiveness of interventions to increase adherence to therapeutic exercise in people with osteoarthritis will also be presented.

**Key Practice Points:**

- Participants will have an increased appreciation of the diverse multi-factorial array of barriers that people with osteoarthritis experience when trying to participate in exercise, and will gain an understanding of how behaviour change theory can help identify potential strategies to promote adherence in patient's knee osteoarthritis.

### EFFECTS OF AQUATIC EXERCISE INTERVENTION ON TRUNK STRENGTH AND FUNCTIONAL RECOVERY FOR PATIENTS WITH LUMBAR FUSION

**Huang A<sup>1,2</sup>**, Chou W<sup>3</sup>, Huang C<sup>4</sup>, Chen W<sup>1,2</sup>

<sup>1</sup>National Yang-Ming University In Taiwan, Taipei City, Taiwan , <sup>2</sup>Department of Rehabilitation, Cheng Hsin General Hospital, Taipei City, Taiwan , <sup>3</sup>Department of Orthopedics, Cheng Hsin General Hospital, Taipei City, Taiwan , <sup>4</sup>Department of Medical Imaging, Cheng Hsin General Hospital, Taipei City, Taiwan

AG6, Meeting Room C3.5, October 20, 2017, 11:40 AM - 12:40 PM

**Aim:**

This study was to evaluate the effect of an early aquatic exercise program on trunk muscle function and functional recovery for patients with lumbar fusion.

**Design:**

This was a randomized control trial, consecutive patients 4 weeks after lumbar fusion were randomized into an aquatic exercise group (n=10) or a home exercise group (n=14).

**Methods:**

A total of 24 patients were recruited in this study. There were randomized into an aquatic exercise group (n=10) or a home exercise (control) group (n=14). Outcome included trunk flexion and extension strength, core stability, resting and movement pain (numerical pain rating scale, NRS), time up and go test (TUGT), disability (Oswestry Disability Index, ODI), quality of life (Short- Form 12, SF-12), lumbar multifidus (LM) muscle thickness (ultrasound imaging), and perceived improvement. The assessment was conducted at baseline, 4 weeks after surgery, and after 6 weeks intervention. Statistical analysis: Independent t-tests were used for between-group baseline comparison. The outcome measures were analyzed with two-way repeated-measure ANOVAs. Significance level was set at  $p < 0.05$ .

**Results:**

After 6 weeks of intervention, patients in the aquatic exercise group showed significant improvements on ODI, SF-12 Physical Component Summary scale, resting and movement NRS, trunk extensor strength, LM muscle thickness, and perceived improvement.

**Conclusion/Key Practice Points:**

- Six-week aquatic exercise program was superior to home exercise for patients 4 weeks post lumbar fusion to improve disability, quality of life, trunk extensor strength, functional performance, lumbar multifidus muscle thickness and lumbopelvic stability.

## BALANCE DURING FUNCTIONAL EXERCISE IN OLDER ADULTS: ON LAND COMPARED TO IN WATER

**Villalta E<sup>1</sup>**, Ramage E<sup>2</sup>, Kershaw M<sup>3</sup>, Geigle P<sup>4</sup>, Rahmann A<sup>5</sup>, Heywood, S<sup>6</sup>

<sup>1</sup>St Vincent's Hospital, Melbourne, Australia, <sup>2</sup>Royal Children's Hospital, Parkville, Australia, <sup>3</sup>Australian Catholic University, Melbourne, Australia, <sup>4</sup>University of Maryland, College Park, United States, <sup>5</sup>Australian Catholic University, Brisbane, Australia, <sup>6</sup>University of the Sunshine Coast, Sippy Downs, Australia

AG6, Meeting Room C3.5, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

To test balance control during functional lower limb exercise on land and in water differ in people over the age of 60 with and without knee osteoarthritis

### Design:

Cross-sectional study

### Method:

18 healthy older adults (67.8±4.5 yrs; height 168.0±9.4cm; weight 74.4±14.6kg; 10 female) and 12 older adults with unilateral knee osteoarthritis (70.75±4.9 yrs; height 170.7±7.6cm; weight 82.2±15.5kg; 4 female) completed functional exercises on land and in water at both waist and chest depth. Squats and calf raises were performed on double leg (no support) and single leg (on the affected leg if applicable with light touch support from the contralateral upper limb). Exercises were completed at slow, medium and fastest possible speed.

### Results:

Similar outcomes were found between groups for balance control across the different environments. Slow calf raises led to the greatest loss of balance in both groups similarly (Land 25-50%; Waist: 50-72%; Chest 17-42%). Very few participants lost their balance when performing calf raises at faster speeds. There was greater loss of balance in squats in water compared to on land.

### Conclusion/Key Practice Points:

- Calf raises provide a challenging task for balance in older people and water may be safe environment to complete demanding balance training
- Slow exercises with a small base of support (such as calf raises) may be more challenging across all environments than faster movement but the connection to functional movement must be considered
- Research into balance reactions and the influence of dual- and multi-task exercises in water is needed.

## HOW LOUD IS HORSE RIDING?

**Hawson L<sup>1</sup>**

<sup>1</sup>Charles Sturt University, Wagga Wagga, Australia

APG6, Meeting Room C3.4, October 20, 2017, 11:40 AM - 12:40 PM

Being ridden is an ethological and biomechanical challenge for the horse while the act of riding demands quick proprioceptive processing, strength, reaction time, balance and endurance. The cross-species communication that occurs between rider and horse is a complex mixture of haptic, proprioceptive, auditory and probably olfactory/gustatory signals. This communication is both simultaneous and two-way. Recent research has shed light on how the biomechanics of each member impact on both the movement efficiency and the signalling processes employed in the horse/rider dyad.

Technology has always been an intrinsic part of horse riding. Equipment, including bits, saddles, pads, spurs, whips, bridle-ware and other apparatus are commonly used to amplify signal from rider to horse and/or change the biomechanical performance of the dyad. How do these pieces of equipment interact with the operation of the horse/rider dyad? Do they compensate for inherent asymmetries and other problems or do they potentially make things worse? What does the current science suggest and what are the implications for physical therapists working with horses and humans?

This presentation will review recent developments in the understanding of the ridden horse/human dyad in terms of biomechanics and communication processes.

**Key Practice Points:**

- This presentation will provide practitioners with an update on the latest research in equitation science.
- The emphasis will be on the communication process between horse and rider in terms of both signalling and biomechanics.
- Practitioners can expect to not only develop greater insight into the complexities of interspecies communication that is horse riding but also some useful concepts to use when treating both equine and human components of the horse/rider dyad.

## ENGAGEMENT WITH TECHNOLOGY BY PEOPLE ATTENDING PULMONARY REHABILITATION PROGRAMS: A SURVEY

**McKeough Z<sup>1</sup>**, Seidman Z<sup>1</sup>, Wootton S<sup>2</sup>, Leung R<sup>3</sup>, Spencer L<sup>4</sup>, Dale M<sup>5</sup>, Dennis S<sup>1</sup>, McNamara R<sup>6</sup>

<sup>1</sup>*Faculty of Health Sciences, The University of Sydney, Sydney, Australia*, <sup>2</sup>*Northern Sydney Chronic Disease Community Rehabilitation Service, Macquarie Hospital, North Ryde, Australia*, <sup>3</sup>*Department of Physiotherapy, Concord Repatriation General Hospital, Concord, Australia*, <sup>4</sup>*Department of Physiotherapy, Royal Prince Alfred Hospital, Camperdown, Australia*, <sup>5</sup>*Department of Physiotherapy, St Vincent's Hospital, Darlinghurst, Australia*, <sup>6</sup>*Departments of Respiratory and Sleep Medicine, and Physiotherapy, Prince of Wales Hospital, Randwick, Australia*

CRP6A, Meeting Room C4.3, October 20, 2017, 11:40 AM - 12:40 PM

**Aim:**

To determine the level of engagement with technology by people attending pulmonary rehabilitation programs and whether this is associated with willingness to use pulmonary telerehabilitation.

**Design:**

A prospective, cross-sectional, multi-site survey study.

**Method:**

A convenience sample of people with chronic respiratory disease attending a pulmonary rehabilitation program, maintenance exercise class or support group across five metropolitan sites in Sydney were recruited between December 2015 and April 2016. All participants were asked to complete a purpose-designed survey of twenty-six questions addressing level of engagement with technology, skill competency and willingness to use telerehabilitation. A multivariate regression model was used to determine factors associated with willingness to use telerehabilitation.

**Results:** Two hundred and fifty-four participants (100% response rate) completed the survey (41% male, age [mean] 73 [SD 10] years, FEV<sub>1</sub> % predicted 59 [SD 23]). Ninety-two percent (n=233) of participants accessed at least one technological device, of which 70% (n=164) reported regular computer or tablet use, 85% (n=198) regularly used mobile phones, and 57% (n=144) self-rated their technology skill competency as good. Sixty percent (n=153) of all participants were willing to use telerehabilitation. Computer use (OR 3.14, 95% CI 1.72 to 5.71) and regular mobile phone use (OR 2.83, 95% CI 1.32 to 6.09) were most associated with a willingness to use telerehabilitation.

**Conclusion/Key Practice Points:**

- People attending metropolitan pulmonary rehabilitation programs had substantial technology engagement, particularly with mobile phones.
- The majority of participants were willing to use telerehabilitation, especially if they were regular users of technological devices.

## RIGHT INFORMATION, RIGHT TIME AND RIGHT PLACE: USING DIGITAL TECHNOLOGY TO EMPOWER PHYSIOTHERAPISTS 24/7 IN AN ACUTE CARE ENVIRONMENT

**Fitzgerald S<sup>1</sup>**, Donnelly G<sup>1</sup>

<sup>1</sup>Canterbury District Health Board, Christchurch, New Zealand

CRP6A, Meeting Room C4.3, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

To investigate 24 hour point-of-care access to physiotherapy clinical resources to support clinical decision making in the acute setting and promote accurate and efficient provision of patient care.

### Design:

A participatory design involving seven stages was conducted between January 2014 and April 2017. This method was applied to ensure active engagement and contribution by the end users/physiotherapists.

### Method:

Physiotherapists were surveyed (n=18) to explore three key themes: information resources required at point-of-care, perceived confidence when working in isolation oncall, and digital engagement/literacy. A time-in-motion study established the time taken to locate existing paper based resources. Alignment of physiotherapy resources, protocols and guidelines with current evidence was undertaken, and a website 'physio 24/7' created. Quarterly data analysis was performed to evaluate website usage. A nine month follow-up survey was conducted to identify how 'physio 24/7' meets physiotherapists' needs and reassess staff confidence when working in isolation.

### Results:

Information technology support and user testing was engaged to develop a website 'physio 24/7' which was launched in June 2016. Physiotherapists' confidence rate working oncall has improved since the website launch (83% versus 100% respectively). Website analytics demonstrate a high level of user uptake with 1,807 sessions in nine months and access occurring at point-of-care on desktop and mobile devices. The physiotherapy service saves 100 minutes daily with the use of physio 24/7.

### Conclusion/Key Practice Points:

- Point-of-care access to clinical resources improves physiotherapists' confidence.
- Access to physio 24/7 saves staff time.
- Digital resources are well utilized in an acute setting.

## DELIVERING GROUP-BASED REHABILITATION INTO THE HOME VIA VIDEOCONFERENCING: LESSONS LEARNT FROM A HEART FAILURE TELEREHABILITATION PROJECT

**Hwang R<sup>1,2</sup>**, Bruning J<sup>3</sup>, Mandrusiak A<sup>2</sup>, Morris N<sup>4,5</sup>, Russell T<sup>2,6</sup>

<sup>1</sup>Princess Alexandra Hospital, Metro South Health., Brisbane, Australia, <sup>2</sup>School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, Australia, <sup>3</sup>Heart Failure Support Service, The Prince Charles Hospital, Brisbane, Australia, <sup>4</sup>School of Allied Health Sciences, Griffith University and Menzies Health Institute Queensland, Gold Coast, Australia, <sup>5</sup>Allied Health Research Collaborative, The Prince Charles Hospital, Brisbane, Australia, <sup>6</sup>Centre for Research Excellence in Telehealth, The University of Queensland, Brisbane, Australia

CRP6A, Meeting Room C4.3, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

To identify practices which optimise delivery of a group-based video telerehabilitation program in the homes of people with heart failure.

### Design:

A nested study within a randomised controlled trial. Mixed methods: qualitative and quantitative analysis of logbooks from a telerehabilitation program. The telerehabilitation program consisted of a 12-week, real-time exercise and education intervention delivered into the homes twice-weekly, using online group-based videoconference.

#### Method:

The logbook was completed by physiotherapists involved in the delivery of the telerehabilitation program, after each session and throughout the implementation phase. Data included: number of participants, type and number of difficulties encountered, and the problem-solving approaches used. Data from the logbook were coded, with thematic analysis undertaken. Descriptive statistics were also undertaken.

#### Results:

A total of 255 telerehabilitation sessions were delivered between 2013 and 2016. Mean number of participants connected was  $2 \pm 1$  per session. Some incidences of auditory difficulties (19%), internet drop-outs (13%), visual difficulties (11%) and issues with accessing online videoconference (9%) were reported. Strategies to address these technical difficulties included: phone to replace audio communications (18%), reliance on audio and typing communications (11%), re-entry to the videoconferencing room or rebooting the computer (2%), and using lower bandwidth (2%). Unexpected benefits included support person participating in the exercises, program portability and computer skill acquisition.

#### Conclusion/ Key Practice Points:

- Although there were some technical difficulties, clinicians and participants successfully found solutions.
- Information on the practices which optimise the delivery of a telerehabilitation program can help to facilitate future uptake and success of the program.

### mHEALTH PREVENTION SERVICES AND THEIR IMPLEMENTATION

#### **Redfern J<sup>1</sup>**

<sup>1</sup>*Westmead Clinical School, Sydney Medical School, University of Sydney, ,*

CRP6A, Meeting Room C4.3, October 20, 2017, 11:40 AM - 12:40 PM

Non-communicable diseases and their prevention are rapidly increasing the global health burden. Despite the overwhelming evidence of the benefits of preventive care, guidelines are poorly adhered to and implemented and there are vast numbers of people and populations who are not reached by traditional health systems strategies. In recent years, there has been a proliferation in digital technology. This includes hardware and software developments that can potentially support delivery of preventive health strategies. Therefore, the use and implementation of mobile health systems, often referred to as mhealth, can be used to support practice, provider and patient directed approaches. Such strategies include electronic decision support systems, apps and hardware devices. The aim of this presentation is to provide an overview of some current examples and strategies for implementation. The example of a contemporary text messaging service for cardiovascular disease management will be described from concept and software development to randomised controlled trials and eventual implementation research will be explored. It is intended that delegates will gain insight into new ways in which mhealth can be developed and implemented to support preventive healthcare to widespread populations in an efficient and scalable way.

### SHOULD WE BOTHER WITH ANY CHEST PHYSIOTHERAPY IN ICU?

#### **Ntoumenopoulos G<sup>1</sup>**

<sup>1</sup>*University of Technology Sydney, Sydney, Australia*

CRP6B, Meeting Room C4.7, October 20, 2017, 11:40 AM - 12:40 PM

The evidence base for chest physiotherapy in intensive care in regards to key patient outcomes such as time on mechanical ventilation and mortality is conflicting. Chest physiotherapy however can provide short term beneficial changes to the clearance of airway secretions, lung/thorax compliance and recruitment of lobar collapse. The outcomes measures used by physiotherapy may not provide the level of diagnostic accuracy required in regards to clinical decision making and treatment effectiveness. We will explore this evidence base and provide insights to potential future directions for physiotherapy in intensive care.

## EARLY MOBILISATION IN ICU - THE STATE OF PLAY

**Hodgson C**

CRP6B, Meeting Room C4.7, October 20, 2017, 11:40 AM - 12:40 PM

Early mobilisation in the intensive care unit is being used to improve muscle strength, reduce bed rest and to prevent the long term functional consequences of critical illness. It is currently a hot topic, and the use of early mobilisation as a physiotherapy intervention provides our profession with an exciting opportunity to improve patient outcomes. However over 2000 patients have been randomised across 15 randomised trials, with most studies showing no long-term benefit compared to standard care. The early ICU trials have been generally small phase II trials in carefully selected populations, showing feasibility and promising effects on length of stay, or functional outcomes at the end of the ICU intervention. Despite the fact that the trials have been relatively small, international and Australian guidelines have been published without definitive patient-centred evidence of benefit or harm. While reducing length of stay may reduce the hospital costs, the importance of long-term patient-centered outcomes cannot be under-estimated and is crucial for future trials. Given the speed at which practice is changing, the time for a large, definitive trial of early mobilisation in ICU is now.

## CHANGES IN EVIDENCE-BASED PRACTICE KNOWLEDGE, CONFIDENCE, PRACTICE AND PERCEPTIONS AFTER A YEAR IN THE PHYSIOTHERAPY WORKFORCE: A MIXED METHODS STUDY

**McEvoy M**<sup>1</sup>, Lewis L<sup>2</sup>, Luker J<sup>1</sup>, Fryer C<sup>1</sup>

<sup>1</sup>University of South Australia, Adelaide, Australia, <sup>2</sup>Flinders University, Bedford Park, Australia

EDU6, Meeting Room C4.11, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

To investigate changes in Evidence-Based Practice (EBP) outcomes, and perceptions of graduate physiotherapists after a year in the workforce.

### Design:

Mixed methods

### Method:

Physiotherapy students completed two valid and reliable EBP questionnaires (self-reported, actual knowledge) at graduation and after a year in the workforce. Interviews were conducted after graduation to explore perceptions and practice of EBP. Matched data were analysed quantitatively. Changes in EBP domain scores were analysed using paired sample t-tests ( $p < 0.05$ ), 95% CI and effect sizes (ES). Interview data were analysed thematically.

Results: Matched data were available for 50 students. The scores for all EBP domains decreased after one year in the workforce ( [mean difference (CI), p value, ES]: Relevance -4.1 (2.4-5.7),  $p < 0.001$ , ES 0.69↓; Terminology -2.4 (-0.06-4.8),  $p = 0.055$ , ES 0.28↓; Confidence -3.7 (1.8-5.5),  $p < 0.001$ , ES 0.57↓; Practice -1.5 (-0.35-3.3),  $p = 0.11$ , ES 0.23↓; Sympathy -0.29 (0.80-1.4),  $p = 0.59$ , ES 0.08↓; Actual Knowledge -0.23 (-0.35-0.81),  $p = 0.43$ , ES=0.11↓. Of the fourteen graduates interviewed, nine reported using EBP in the first year to inform patient management. Many reported a loss of confidence in their EBP skills and knowledge, with positive role models seen as enablers to their use of EBP, while access to resources and time were barriers.

### Conclusion/Key Practice Points:

- After a year in the workforce, there was a decline in participants' EBP knowledge, attitudes and practices, particularly in the domains of Relevance and Confidence.
- Greater support for graduates in the workplace to maintain EBP attitudes and skills may be needed in the first year of physiotherapy work.

## EMPLOYMENT PREFERENCES OF PHYSICAL THERAPY STUDENTS IN THE UNITED STATES: A CROSS-SECTIONAL SURVEY

**Warren J<sup>1</sup>**, Burke-Doe A<sup>1</sup>, Landry M<sup>2</sup>

<sup>1</sup>University of St Augustine for Health Sciences, San Diego, United States, <sup>2</sup>Duke University, Durham, United States

EDU6, Meeting Room C4.11, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

The purpose of this study was to identify the employment preferences of final year physical therapy students and the underlying reasons for these preferences. These findings were then compared to workforce data to analyze if the preferences correlate with the workforce demand. This study looked into the role that professional socialization plays in the formation of these career choices and professional preferences.

### Design:

This research was a cross-sectional survey of final year physical therapy students recruited from programs across the US. The survey was based on a conceptual framework incorporating professional socialization and career choices in a combination of open-ended and forced choice questions.

### Method:

The 271 participants were a non-probability voluntary sample. They were recruited from programs covering the three main geographical areas of the US, and from for-profit, private and public institutions. The data analysis was predominantly descriptive statistics.

### Results:

The most realistic preferred employment position was evenly split between public (40%) and private healthcare sectors (38%), with the musculoskeletal area of practice being the most popular choice (43.8%). A concerning result was the small percentage students who were interested in working in the cardiopulmonary (0%), neurologic (14.2%), and geriatric (19%) areas.

### Conclusion/Key Practice Points:

- To develop the areas of public need there needs to be a change in focus at the curricula level, with involvement of the educational accreditation body.
- The role model is an influential effect of professional socialization.
- This passive process could be improved through the intentional education of potential role models.

## TRAINING PHYSIOTHERAPISTS IN PERSON-CENTRED PRACTICE FOR PEOPLE WITH OSTEOARTHRITIS: A QUALITATIVE CASE STUDY

**Lawford B<sup>1</sup>**, Delany C<sup>1</sup>, Bennell K<sup>1</sup>, Bills C<sup>2</sup>, Gale J<sup>2</sup>, Hinman R<sup>1</sup>

<sup>1</sup>University of Melbourne, Parkville, Australia, <sup>2</sup>HealthChange Australia, Sydney, Australia

EDU6, Meeting Room C4.11, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

To explore physiotherapists' experiences with, and the impacts of, a training program in person-centred practice to support exercise adherence in people with knee osteoarthritis.

### Design:

A qualitative case study using semi-structured interviews, nested within a clinical trial.

### Method:

Eight Australian physiotherapists were interviewed before, and after, training in person-centred practice for people with knee osteoarthritis. Training involved a two-day workshop, skills practice and audit of eight consultations with four patients (per therapist), and a final single-day workshop for audit feedback and consolidation. Semi-structured interviews were audio-recorded and transcribed verbatim. Data were thematically analysed.

#### Results:

Three pre-training themes arose regarding: usual communication style; definitions of person-centred care and; sharing exercise adherence responsibility. Three themes related to the training experience emerged: learning a new language; challenging conceptions of practice and; putting it into practice. Post-training, three themes arose regarding: new knowledge deepening understanding of person-centred care; changing beliefs about sharing responsibilities; and changed conceptions of role. Therapists valued the extended skills practice period and follow-up training held three months after initial training.

#### Conclusion:

Although physiotherapists found training overwhelming initially as they realised the limitations of their current knowledge and clinical practice, they felt more confident and able to provide person-centred care to people with knee osteoarthritis by the end of training. Training in structured person-centred methodology that provides opportunity for skills practice with patients using a restructured consultation framework can change physiotherapists' beliefs about their roles when managing patients with osteoarthritis and positively impact their clinical practice.

### NEW GRADUATE TRAINING PROGRAM IN PRIVATE PRACTICE

#### **Cooper C<sup>1</sup>**

<sup>1</sup>Mitchell Physiotherapy, Maitland, Australia

EDU6, Meeting Room C4.11, October 20, 2017, 11:40 AM - 12:40 PM

#### Background:

Employing new graduates who lack clinical experience, and don't understand market forces can be challenging in the competitive environment of private practice. 61% of the physiotherapy work force are employed in the private sector. However, University education is geared towards the work force being employed in the public sector, with the majority of clinical placements occurring in hospitals. For the past 5 years I have successfully evolved a new graduate training program, to prepare and allow new graduates to thrive in my Private Practice.

#### Aims and Objectives:

Enable Private Practitioners to recruit new Graduates with confidence by teaching a model of training and development as part of their annual business cycle. Present a method of New Graduate recruitment including time frames, and employment contracts resulting in staff that are a good fit to the current team.

#### Conclusion/Key Practice Points:

At the end of this session physiotherapists will have:

- Tools enabling them to implement a new graduate program
- An understanding of how such a program could implemented and what frame work is required for its success
- Awareness of the potential hazards/risks.

### FACTORS ASSOCIATED WITH A PHYSIOTHERAPIST'S RESEARCH INTEREST, CONFIDENCE AND EXPERIENCE

#### **Semciw A<sup>1,2,3</sup>**, Jung S<sup>1</sup>, Hearn C<sup>2</sup>, McPhail S<sup>3,4</sup>

<sup>1</sup>The University Of Queensland, Auchenflower, Australia, <sup>2</sup>Princess Alexandra Hospital, Woolloongabba, Australia, <sup>3</sup>Center for Functioning and Health Research, Woolloongabba, Australia, <sup>4</sup>Queensland University of Technology, Brisbane, Australia

EDU6, Meeting Room C4.11, October 20, 2017, 11:40 AM - 12:40 PM

#### Aim:

Describe the association between a physiotherapist's research interest, confidence and experience, with their demographic, education and employment characteristics.

#### Design:

Cross-sectional survey

#### Methods:

Physiotherapists at two major teaching hospitals in Brisbane, Queensland, were invited to complete a survey regarding their research interest, confidence and experience using a 'research spider' tool. The tool is presented as a star plot, and covers ten research related items including 'writing a research proposal', 'analysing and interpreting results' and 'applying for research funding'. A multivariate linear regression model (entry method) was used to determine the association between a research domain (interest, confidence or experience) with gender, years of clinical experience, employment status (e.g. full-time), research influence on practice rating and highest tertiary qualification.

**Results:** 84 physiotherapists (61 female) volunteered for the study. High levels of research interest were associated with less years of clinical experience, male gender, and permanent employment. High levels of research confidence were associated with higher qualifications (e.g. higher degree research), male gender and permanent employment. High levels of research experience were associated with higher qualifications (e.g. higher degree research) and permanent employment.

#### Conclusion:

- These results facilitate research capacity building initiatives within the physiotherapy workforce.
- Physiotherapists new to the workforce are 'interested' in research, and would benefit from targeted strategies to engage in research related activities, e.g. collect data and screen participants for established research projects.
- Gaining higher qualifications (e.g. higher degree research) may improve a physiotherapist's research confidence and experience.

#### EXERCISE FOR FALL PREVENTION: EVIDENCE UPDATE

##### **Sherrington C<sup>1</sup>**

<sup>1</sup>*University of Sydney, Australia*

GPA6, Meeting Room C3.6, October 20, 2017, 11:40 AM - 12:40 PM

#### Outline:

Falls remain an unresolved problem for our ageing population with serious consequences for health systems and individuals. This presentation will overview the current best evidence from systematic reviews and randomised trials about exercise-based fall prevention interventions as well as drawing implications for physiotherapy practice. The author's review (Sherrington et al BJSM, Epub before print, 4 Oct 2016) will form the basis of the presentation. In this review, 99 comparisons from 88 trials with 19,478 participants were available for meta-analysis. Overall, exercise reduced the rate of falls in community-dwelling older people by 21% (pooled rate ratio 0.79, 95% CI 0.73 to 0.85,  $p < 0.001$ , I<sup>2</sup> 47%, 69 comparisons) with greater effects seen from exercise programmes that challenged balance and involved more than 3 hours/week of exercise. These variables explained 76% of the between-trial heterogeneity and in combination led to a 39% reduction in falls (incident rate ratio 0.61, 95% CI 0.53 to 0.72,  $p < 0.001$ ). Exercise also had a fall prevention effect in community-dwelling people with Parkinson's disease (pooled rate ratio 0.47, 95% CI 0.30 to 0.73,  $p = 0.001$ , I<sup>2</sup> 65%, 6 comparisons) or cognitive impairment (pooled rate ratio 0.55, 95% CI 0.37 to 0.83,  $p = 0.004$ , I<sup>2</sup> 21%, 3 comparisons).

#### Key Practice Points:

- Exercise as a single intervention can prevent falls in community-dwelling older people.
- Exercise programmes that challenge balance and are of a higher dose have larger effects.
- The impact of exercise as a single intervention in clinical groups and aged care facility residents requires further investigation, but promising results are evident for people with Parkinson's disease and cognitive impairment.

## STRATEGIES TO PROMOTE UPTAKE AND ADHERENCE TO FALL PREVENTION EXERCISE PROGRAMS

**Tiedemann A<sup>1</sup>**

<sup>1</sup>*Sydney Medical School, The University of Sydney, Sydney, Australia*

GPA6, Meeting Room C3.6, October 20, 2017, 11:40 AM - 12:40 PM

### Background:

Population surveys highlight the low rates of uptake to exercise programs likely to prevent falls among older Australians. Therefore, there is a need for health professionals to consider strategies for maximising uptake and adherence to fall prevention programs.

### Objective:

This presentation will outline the issue of poor adherence to exercise programs and discuss research findings that have identified the factors associated with better adherence. This presentation will also introduce some strategies that can be used to promote uptake, including health coaching. We will also introduce the participants to a range of resources including websites and community-based services that may be used to support the implementation and maintenance of fall prevention exercise programs for older people.

### Key Practice Points:

- Older people don't necessarily relate to fall prevention messages so focussing on healthy ageing may be more effective
- Consideration of individual goals and preferences may increase adherence to fall prevention exercise programs. A range of resources, services and websites are available to assist with the implementation of exercise programs for older people.

## UPDATE ON SCREENING FOR SERIOUS DISEASE WITH RED FLAGS

**Maher C**

MPA6, Darling Harbour Theatre, October 20, 2017, 11:40 AM - 12:40 PM

Most clinical practice guidelines and texts for managing low back pain present lists of red flags to identify patients who have medically serious pathology as the cause of their low back pain. Unfortunately most of the advice is wrong because it ignores the diagnostic research in this area. Two common problems are endorsing red flags that have no value in screening for serious pathology and encouraging clinicians to act upon isolated +ve red flags. These misunderstandings contribute to the problem of overdiagnosis in the area of back pain.

The aim of the presentation is to correct some of the common misunderstandings about red flags. The presentation presumes familiarity with the clinical management of low back pain but little or no understanding of diagnostic research. The presenter will review the evidence on the prevalence of medically serious pathology and the diagnostic accuracy of red flags. The aim is to provide a better understanding on the role of red flags to screen for serious disease.

### Key Practice Points:

- Medically serious pathology is a rare in patients presenting to primary care with low back pain.
- There are only a small subset of red flags that have acceptably high diagnostic accuracy.
- Most red flags identified by clinicians are false positives.
- A decision to order diagnostic work-up should be based upon a combination of clinical features (not a single red flag) and reflect the strength of clinical suspicion and the consequences of a delayed diagnosis.

## LOW BACK PAIN IN OLDER ADULTS - RISK FACTORS, PROGNOSIS AND MANAGEMENT

**Ferreira M<sup>1</sup>**

<sup>1</sup>*The University of Sydney, Sydney, Australia*

MPA6, Darling Harbour Theatre, October 20, 2017, 11:40 AM - 12:40 PM

This presentation will discuss the most recent evidence on the risk factors, prognosis and contemporary approaches to treatment of low back pain in the older population. The impact of low back pain in this population, including financial and personal burden will also be presented. Recent evidence on the efficacy and safety of pharmacological, conservative and surgical approaches will be appraised and discussed. Polypharmacy and the impact of comorbidities on the prognosis and management of older people with low back pain will also be considered.

Key practice points:

- Low back pain is highly prevalent and burdensome among the older population
- The evidence from randomised clinical trials largely excludes the older patient with low back pain
- Research shows the management of low back pain in the older patient is less likely to be evidence-based.

## BIOLOGICAL CONTRIBUTORS TO LOW BACK PAIN

**Hancock M<sup>1</sup>**

<sup>1</sup>*Macquarie University, North Ryde, Australia*

MPA6, Darling Harbour Theatre, October 20, 2017, 11:40 AM - 12:40 PM

It is widely accepted that low back pain is a complex multifactorial condition. Over the last 10-20 years there has been a focus on better understanding the role of psycho-social contributors to low back pain (LBP) and less attention or progress in understanding biological contributors, particularly nociceptive sources.

The importance of lumbar pathology identified on MRI remains controversial and uncertain. The majority of previous studies investigating the relationship between MRI findings and LBP report small to moderate associations for some but not all MRI findings. It is possible that the weak associations may in part be due to limitations in the approaches used to assess and analyse MRI findings.

This presentation will provide an update on the current knowledge regarding pathology identified on imaging and its relationship with LBP. The presentation will discuss some of the key challenges and potential solutions for research aiming to better understand the role lumbar pathology plays in the complex multifactorial condition of LBP.

Key Practice Points

- Imaging is not recommended for the majority of people presenting with LBP
- There is evidence that some MRI findings are associated with LBP, but no evidence that imaging improves outcomes for patients with LBP
- Looking at imaging in new ways may substantially increase the relationship with LBP
- High quality studies are needed to improve understanding of the nociceptive contributors to LBP.

## EXERCISE AFTER SPINAL CORD INJURY

**Galea M<sup>1</sup>**

<sup>1</sup>*Department of Medicine, Royal Melbourne Hospital, The University of Melbourne, Parkville, Australia*

NNG6A, Meeting Room C4.8, October 20, 2017, 11:40 AM - 12:40 PM

Spinal cord injury (SCI) is an extreme example of deconditioning or movement deprivation, which has profound effects on the neuromusculoskeletal system. Rehabilitation after SCI has traditionally involved teaching compensatory strategies for identified impairments and deficits in order to improve functional independence. There is some evidence that regular and intensive activity-based therapies, directed at activation of the paralysed extremities, promotes neurological recovery and improvement of walking ability in people with incomplete SCI. The SCIPA (Spinal Cord Injury and Physical Activity) research program was a bi-national multi-site program concerned with understanding the effects of exercise on recovery, health and

well-being after spinal cord injury. Projects involved the investigation of FES-assisted hand exercise, early exercise for the lower limbs, locomotor training and FES-cycling, and a Train the Trainers program to improve physical activity levels after SCI.

Apart from the results of the studies, the SCIPA program raised the profile of exercise within the SCI community. The interventions were found to be safe. Clinicians at each site were engaged in collaborative research for the first time. Project staff were trained in the clinical trials process, as well as in novel interventions. More research is needed to determine the optimum dosage and those for whom the type of interventions investigated as part of SCIPA will lead to meaningful clinical benefit.

#### Key Practice Points

- There is strong evidence for the benefit of regular physical activity for people with SCI
- Exercise should be an integral component of physical rehabilitation after SCI.

#### EXPLORATORY ANALYSIS OF CONFOUNDING FACTORS IN THE SCIPA SWITCH ON TRIAL OF EARLY EXERCISE AFTER ACUTE SPINAL CORD INJURY

**Panisset M<sup>1</sup>**, El-Ansary D<sup>1</sup>, Galea M<sup>1</sup>

<sup>1</sup>University of Melbourne, Parkville, Australia

NNG6A, Meeting Room C4.8, October 20, 2017, 11:40 AM - 12:40 PM

The SCIPA Switch-On trial compared the efficacy of functional electrical stimulation–assisted cycling (FESC) and passive cycling (PC) to attenuate muscle atrophy after acute spinal cord injury (SCI). Both interventions examined were safe, feasible, and well-tolerated early after SCI, however no between-group differences were found due to within-group variability and low sample size.

#### Objectives:

1) Present exploratory analyses of secondary outcomes (thigh muscle volume change) 2) identify potential confounding factors including physiological characteristics of non-responders and implementation of the intervention (fidelity and physiological responses)

#### Design:

Exploratory analysis of secondary outcomes from a randomized controlled trial conducted from 4-16 weeks post-injury. Case series.

#### Results:

Attendance was >80%. Median change in thigh muscle volume for FESC was -1.6% [-18.9, 8.9%], and -14.2% [-22.2, -5.6%] for PC. Attenuation of atrophy (<10%) occurred in five cases (3 FESC, 2 PC). Six demonstrated increased thigh muscle volume (4 FESC, 2 PC) Aggregated data showed a moderate relationship between combined quadriceps and hamstring volume and frequency (n=19, r=0.53, p=0.019) and total number of sessions (r=0.51, p=0.023), but not cumulative exercise time. This relationship with frequency was strongest in FESC (quadriceps r=0.70, p=0.023; hamstrings r=0.63, p=0.048). Potential factors affecting response included presence of pressure areas, persistent pain, baseline muscularity and ambulatory status.

#### Key Practice Points:

- Both interventions examined were safe, feasible, well tolerated and may be beneficial for some patients
- Frequency and number of sessions may be more important than total exercise time.
- Further research is needed to identify factors prognostic of poor response.

## CITATION OF PRIOR RESEARCH HAS INCREASED IN INTRODUCTION AND DISCUSSION SECTIONS WITH TIME: A SURVEY OF CLINICAL TRIALS IN PHYSIOTHERAPY

**Moseley A<sup>1</sup>**, Hoderlein X, Elkins M

<sup>1</sup>*Musculoskeletal Health Sydney, University Of Sydney, Australia*

NNG6A, Meeting Room C4.8, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

Investigate the extent to which reports of physiotherapy trials use high-quality clinical research to (1) justify the need for the trial and (2) interpret the trial's results. The impact of time and area of physiotherapy (neurological vs. non-neurological) were evaluated.

### Design:

Survey of 221 trials randomly selected from the Physiotherapy Evidence Database: 70 (7 neurological) published in 2001 and 151 (34 neurological) in 2015.

### Methods:

Two raters extracted whether a relevant systematic review was cited in the introduction and discussion sections and whether trial results were integrated with the results of the review in the discussion. Disagreements were resolved through discussion.

### Results:

41% of trials cited a review in the introduction (32% neurological, 43% non-neurological). Citation increased with time: 21% for 2001 vs. 50% for 2015 (relative risk 2.3, 95% CI 1.5 to 3.8). The absolute increase was larger for neurological (38%) than non-neurological (30%) trials. While 29% of trials cited a review (20% neurological, 31% non-neurological) in the discussion, only one trial integrated the results of the trial into an existing review. Citation in the discussion increased from 17% in 2001 to 34% in 2015 (2.0, 1.1 to 3.5). Absolute increase was higher in neurological (24%) than non-neurological (19%) trials.

### Conclusion/Key Practice Points:

- Physiotherapy trials increasingly cite high-quality clinical research in the introduction, but integration with existing research in the discussion is rare.
- Citation rates were lower in neurological trials.
- Stronger recommendations could be incorporated into reporting checklists and journal editorial guidelines to encourage use of existing research.

## APPROACHES TO INCREASING PHYSICAL ACTIVITY FOR PEOPLE WITH NEUROLOGICAL CONDITIONS – INSIGHTS FROM THE MULTIPLE SCLEROSIS LITERATURE

**Learmonth Y<sup>1</sup>**

<sup>1</sup>*Murdoch University, Perth, Australia*

NNG6B, Meeting Room C4.10, October 20, 2017, 11:40 AM - 12:40 PM

### Background:

Multiple Sclerosis (MS) is a chronic disease of the central nervous system which affects approximately 23,000 Australians. Symptoms and impairments associated with MS include deficits in physical function and cognitive function, increased fatigue and depression, and reduced quality of life. Over twenty-five years of literature indicates that benefits of exercise in MS include; increased aerobic, walking, balance and cognition; reduced fatigue and depression; and increased quality of life. Benefits might extend to structures within the central nervous system. Further, exercise is safe as there is no evidence to suggest an association with increased relapse rate or symptoms.

### Objective:

Increase attendees awareness of exercise based rehabilitation for persons with MS as delivered by healthcare professionals. This session will cover examples of exercise rehabilitation research interventions conducted in the past decade. Attention will be placed upon results of systematic review and meta-analysis. Recent research highlighting the importance of consumer driven research and the views of persons with MS

and healthcare providers in the MS community will be discussed. Summary and discussion of future research in Australia will be explored.

Key practice point:

- Exercise based rehabilitation is an important strategy for all healthcare professionals associated with the MS Community, knowledge on current literature and future direction in clinical research will inform and improve current clinical practice.

#### THE DISTRIBUTION OF POSITIVE WORK AND POWER GENERATION DURING RUNNING NORMALISES IN THE LOWER-LIMB FOLLOWING RECOVERY FROM TRAUMATIC BRAIN INJURY

**Williams G<sup>1,2</sup>**, Schache A<sup>3</sup>

<sup>1</sup>Physiotherapy Dept, Epworth Hospital, Melbourne, Australia, <sup>2</sup>School of Physiotherapy, The University of Melbourne, Melbourne, Australia, <sup>3</sup>Department of Mechanical Engineering, The University of Melbourne, Melbourne, Australia

NNG6B, Meeting Room C4.10, October 20, 2017, 11:40 AM - 12:40 PM

Aim:

To determine whether improvements in running performance and higher levels of mobility following traumatic brain injury (TBI) are attributable to an improvement in the way lower-limb joints do positive work and generate power or a consolidation of compensatory strategies.

Design:

Cross-sectional cohort study with six-month follow-up.

Methods:

Three-dimensional running analysis was conducted on twelve ambulant people with extremely-severe TBI, and a comparative sample of 10 healthy controls (HC).

Results:

In comparison to HCs, participants with TBI ran at initial assessment with a significantly ( $p < .05$ ) reduced contribution from the ankle to total lower-limb positive work and average power generation during stance phase, and a significantly ( $p < .05$ ) greater contribution from the hip. This proximal compensatory strategy resolved over time such that at six-month follow-up, no significant differences in the relative contributions from the ankle and hip were identified for the participants with TBI when compared to HCs. The reduced total lower-limb power generation was due to reduced positive work and positive power generation at the ankle, which significantly improved at six-month follow-up.

Conclusion:

Recovery of running and high-level mobility following TBI is attributable to an improvement in the way positive work is done and power is generated by the lower-limb joints rather than a consolidation of compensatory strategies.

Key Practice Point:

- Interventions that target ankle positive work and power generation can improve the performance of paretic calf muscles during running.

#### IMPROVED WALKING SPEED IS NOT ASSOCIATED WITH A REDUCTION IN INTER-LIMB COMPENSATORY PATTERNS FOLLOWING TRAUMATIC BRAIN INJURY

**Ryan H<sup>1</sup>**, Williams G<sup>1,2</sup>, Schache A<sup>1,3</sup>

<sup>1</sup>Epworth Healthcare, Melbourne, Australia, <sup>2</sup>School of Physiotherapy, The University of Melbourne, Melbourne, Australia, <sup>3</sup>Department of Mechanical Engineering, The University of Melbourne, Melbourne, Australia

NNG6B, Meeting Room C4.10, October 20, 2017, 11:40 AM - 12:40 PM

Aim:

The aim of this study was to investigate whether improved paretic lower-limb power generation during rehabilitation was associated with reduced inter-limb compensation strategies when walking.

Design:  
Cross-sectional cohort study with six-month follow-up

Method:  
Nineteen ambulant patients with traumatic brain injuries attending physiotherapy for mobility limitations participated in this study. Self-selected walking speed and lower-limb power generation in the step to step transition of gait was analysed using three-dimensional gait analysis. The ratio of ankle power generation in the paretic trail limb to hip extensor power generation in the non-paretic lead limb was compared to healthy controls. Measures were repeated at six months.

Results:  
Statistically significant increases in self-selected walking speed were identified at six months ( $p$  value  $< .05$ ). However, there was no significant relationship between change in paretic ankle power generation and the change in non-paretic hip extension power generation over the six month period (Pearson's  $r = -.23$ ;  $p = .35$ ).

Conclusion:  

- Improved paretic lower-limb power generation was not associated with a reduction in inter-limb compensatory strategies.
- Increased self-selected walking speed was not associated with changes in inter-limb compensatory strategies in the step-to-step transition phase.

#### PARENT PRACTICES OF INFANT POSITIONING AND IMPACT ON HEAD ORIENTATION PROFILE AND DEVELOPMENT OF POSITIONAL PLAGIOCEPHALY IN HEALTHY TERM INFANTS

Leung A<sup>1,2</sup>, Mandrusiak A<sup>1</sup>, Watter P<sup>1</sup>, Gavranich J<sup>3</sup>, Johnston L<sup>1</sup>

<sup>1</sup>School of Health and Rehabilitation Sciences, The University Of Queensland, Brisbane, Australia, <sup>2</sup>Child Development Program, Children's Health Queensland Hospital and Health Service, Australia, <sup>3</sup>Ipswich Hospital, West Moreton Health Service District, Australia

NPG6, Meeting Room C4.1, October 20, 2017, 11:40 AM - 12:40 PM

Aim:  
To explore the relationship between infant body and head positioning, with the development of asymmetrical head orientation and/or positional plagiocephaly.

Design:  
Prospective longitudinal study with three measurement time points.

Method:  
Healthy term infants and their parents were recruited from child health clinics, ante-natal clinics or as community volunteers within a metropolitan health service area. Clinician-measured infant head orientation profile and parent-reported positioning data were collected at 3, 6 and 9 weeks of age. Plagiocephaly was measured at 9 weeks with the modified Cranial Vault Asymmetry Index.

Results:  
94 infants with mean ( $\pm$ SD) age at each assessment point were 21.4( $\pm$ 2.29), 42.1( $\pm$ 2.19) and 63.2( $\pm$ 2.53) days. More severe plagiocephaly was associated with longer supine-sleep-maximum ( $p=0.001$ ) and longer supine-lying-total ( $p=0.014$ ) at 6 weeks. Prone positioning was not associated with plagiocephaly. Parent-reported head orientation asymmetry during awake and sleep time at 3 weeks could predict infants with clinician-measured head asymmetry at 9 weeks. More side-lying-total time was associated with better symmetry in head turning by 9 weeks ( $p=0.013$ ).

Conclusion/Key Practice Points:  

- Infant positioning is associated with early head orientation and plagiocephaly.
- Prolonged total supine when awake should be avoided if the infant shows prolonged supine sleep.
- Side-lying should be encouraged due to its positive effect on infant head midline orientation.

- Early parent-reported infant head orientation asymmetry during awake and sleep times is an indicator for further professional assessment and review.
- A Plagiocephaly Prevention Strategy and a Plagiocephaly Screening Pathway have been developed to guide clinicians and parents in plagiocephaly prevention.

#### EXPLORING THE RELATIONSHIP BETWEEN POSITIONING IN INFANTS AND USE OF EQUIPMENT: AN OBSERVATIONAL STUDY USING BEHAVIOUR MAPPING

**O'laco E<sup>1</sup>**, Liao J<sup>1</sup>, Pacey V<sup>1</sup>, Shepherd R<sup>1</sup>, Dean C<sup>1</sup>, Jones T<sup>1</sup>, Scrivener K<sup>1</sup>

<sup>1</sup>Macquarie University, North Ryde, Australia

NPG6, Meeting Room C4.1, October 20, 2017, 11:40 AM - 12:40 PM

##### Aim:

To determine the proportion of the day typically developing infants spend standing/moving, and what equipment used when engaged in play.

##### Design:

Observational study.

##### Method:

This study was conducted in three childcare centres. Infants, aged 18 months unable to walk independently for 2 m or more, were eligible to participate. Prior to inclusion, the Alberta Infant Motor Scale and the Ages and Stages Questionnaire were undertaken to screen for developmental delay. Behaviour mapping was utilised to record each infant's location, body position, and activity at five-minute intervals. Observations occurred seven hours a day, over three days. Use of descriptive statistics expressed proportion of time awake spent in each activity.

##### Results:

Twenty infants (median age 10.4 months) participated in this study. In all centres, the largest proportion time awake was spent in the meals area (24-44%). Participants spent majority of the day in solitary behaviour (41%). Key positions observed: sitting on a chair (22%), standing (13%), and crawling (10%). When engaged in play, main equipment utilised were toys (22%), and large play items (6.7%), including climbing frames, rails, and play furniture.

##### Conclusion:

Participants were standing/moving for a small proportion of the day, observed to use available equipment to pull to stand, stand, and cruise. Much of this was a reaction to seeing a toy or reaching up to explore.

##### Key Practice Points:

- Physiotherapists provide programs aimed at increasing time infants spend standing/moving at home or in childcare centres, therefore should focus on the presence of appropriate equipment/toys in the everyday environment.

#### THE RELATIONSHIPS BETWEEN GESTATIONAL AGE, SEX AND BIRTH WEIGHT FOR GESTATIONAL AGE WITH MOTOR SKILLS AND MOTOR ACTIVITY IN INFANCY

**Jensen L<sup>1</sup>**, Piek J<sup>2</sup>, Downs J<sup>1,3</sup>

<sup>1</sup>School of Physiotherapy and Exercise Science, Curtin University, Bentley,, Australia, <sup>2</sup>School of Psychology and Speech Pathology, Curtin University, Bentley,, Australia, <sup>3</sup>School of Physiotherapy and Exercise Science, Curtin University and Telethon Kids Institute, The University of Western Australia, Perth,, Australia

NPG6, Meeting Room C4.1, October 20, 2017, 11:40 AM - 12:40 PM

##### Aim:

To determine the relationships between gestational age, sex and birth weight for gestational age with motor skills and activity in infancy.

##### Design:

Cross-sectional study.

#### Method:

Healthy term ( $n = 93$ ) and preterm ( $n = 87$ ) infants, three to 12 months of age, were assessed with the Peabody Developmental Motor Scales to measure gross and fine motor skills. Intensity of motor activity was measured for 24 hours with an Actical® accelerometer. Duration of activity was measured with the Daily Activities of Infants Scale which mothers completed. Intensity and duration were calculated for play and care. Birth weight for gestational age was dichotomized as small (birth weight <10th percentile) or appropriate (birth weight  $\geq$ 10th percentile).

#### Results:

Increasing gestational age, female and appropriate for gestational age infants had higher gross motor scores ( $p = .02$ ). Female ( $p < .001$ ) and appropriate for gestational age ( $p = .02$ ) infants individually and together with later gestational age had higher fine motor scores ( $p < .001$ ). Duration of play and care was the same for all infants. Intensity of activity during play ( $p < .001$ ) and care ( $p = .01$ ) was lower for small for gestational age infants.

#### Conclusion / Key Practice Points:

- Small for gestational age infants, term and preterm, warrant monitoring to track acquisition of motor skills, especially fine motor skills.
- Small for gestational age infants have reduced motor activity that may have implications for later physical activity.
- Male infants who have poor fine motor skills may benefit from intervention.

#### EXAMINING THE ACTIVPAL3 MONITOR IN MEASURING BODY POSITION AND STEP COUNTS IN INFANTS: A VALIDITY STUDY

**Sabhani K<sup>1</sup>**, Sharp P<sup>1</sup>, Scrivener K<sup>1</sup>, Pocovi N<sup>1</sup>, Pacey V<sup>1</sup>, Jones T<sup>1</sup>

<sup>1</sup>Department of Health Professions, Macquarie University, North Ryde, Australia

NPG6, Meeting Room C4.1, October 20, 2017, 11:40 AM - 12:40 PM

#### Aims:

The primary objective of this study was to investigate the validity of the ActivPAL3 in assessing infant activity measured by body position and step count.

#### Design:

Observational Study

#### Method:

Twenty typically developing infants aged 6-18 months with a mean age of 11.4 months were recruited for this study. Demographic information including height and thigh length was recorded. Each participant was observed in their home environment for a minimum of 30 minutes while wearing an ActivPAL3 monitor. Body position and step count were recorded every 15 seconds through a pre-set behaviour mapping protocol (criterion method). The observed activity was compared with the corresponding ActivPAL3 data.

#### Results:

The ActivPAL3 showed strong agreement with behaviour mapping in identifying sitting (83%), standing (76%) and stepping (74%) body positions. There was a significant correlation between the overall step counts recorded by the ActivPAL3 and behaviour mapping ( $r = 0.780$ ,  $p < 0.001$ ) as well as specific step counts for crawling ( $r = 0.740$ ,  $p = 0.001$ ), cruising ( $r = 0.922$ ,  $p = 0.001$ ), and stepping ( $r = 0.896$ ,  $p < 0.001$ ).

#### Conclusions/Key Practice Points:

- This is the first study examining the use of the ActivPAL3 in infants. The ActivPAL3 has acceptable validity for detecting body position and step count.
- When aiming to increase infant movement, it may provide physiotherapists with an objective measurement tool to record activity over a longer period of time in a natural setting, enhancing parental self-reports and clinical examination.

## NEW WORK PRACTICES CREATE NEW CHALLENGES FOR VISION AND POSTURE

**Long J<sup>1,2</sup>**

<sup>1</sup>Jennifer Long Visual Ergonomics, Katoomba, , Australia, <sup>2</sup>School of Optometry and Vision Science, UNSW, , Australia

OHP6, Meeting Room C3.3, October 20, 2017, 11:40 AM - 12:40 PM

Outline of presentation:

Contemporary workplaces are becoming more reliant on digital technology. The number and type of digital devices is expanding to include smartphones, tablets and wearable devices, and they are used in a multitude of environments such as in the office, at home, in vehicles and in transit.

Using a digital device can be visually demanding, particularly when used for extended periods of time. If people have difficulty seeing their work or if they experience visual stress, then they may adopt awkward postures. This can affect their physical and visual comfort.

This presentation will use case examples supported by scientific evidence to:

- Explore the relationship between vision and posture and
- Describe some of the visual and postural challenges which accompany new work practices.

By the end of this presentation participants should:

- Have an understanding of some of the current research related to visual ergonomics and physical and visual comfort.
- Be able to apply this knowledge in their own workplace or when dealing with their own clients.

## HOW WEARABLE TECHNOLOGY CAN BE USED TO REDUCE WORKPLACE INJURY RISK

**Coleman S<sup>1</sup>**

<sup>1</sup>Preventure, Sydney, Australia

OHP6, Meeting Room C3.3, October 20, 2017, 11:40 AM - 12:40 PM

Background:

"The wearable technology industry is entering the maturation phase", was the conclusion drawn by the USA Consumer Technology Association following it's 2017 conference showcasing wearable technology innovations for sport, consumers and the workplace. This is indicating that many of the early problems identified with wearable technology have been solved, and that devices are now more accurate and valid than in previous years. Therefore, they are now more appropriate for measurement of work task physical demands and worker physical capacity.

Aims/objectives:

Participants will gain knowledge about how different types of wearable technology can be used to improve the quality and efficiency of their work task and worker capacity assessments. By the end of the session, participants will have an understanding about the different wearable technology devices available, the level of accuracy and validity of the devices relevant for use in the workplace, and techniques on how these devices can be used to reduce workplace injury risk.

Approach:

The session will involve an initial educational component about the evidence behind the use of wearable technology, the technology used, the variables that can be measured and basic analysis of the data. The second half of the session will involve a demonstration of several different wearable technology devices with active participation by a selection of the participants.

Key Practice Points:

- Participants will have a greater understanding of the role of wearable technology devices in the assessment of specific work task injury risks, and objective assessment of a workers' capacity.

## PRACTITIONER PERCEPTIONS OF WHIPLASH GUIDELINES: A MIXED METHODS STUDY

**Bandong A<sup>1,2</sup>**, Leaver A<sup>1</sup>, Mackey M<sup>1</sup>, Sterling M<sup>3,4</sup>, Kelly J<sup>3,4</sup>, Ritchie C<sup>3,4</sup>, Rebbeck T<sup>1</sup>

<sup>1</sup>Faculty Of Health Sciences, The University Of Sydney, Lidcombe, Australia, <sup>2</sup>Department of Physical Therapy, College of Allied Medical Professions, University of the Philippines, Manila, Philippines, <sup>3</sup>NHMRC Centre of Research Excellence in Recovery Following Road Traffic Injuries, Menzies Health Institute Queensland, Griffith University, Gold Coast, Australia, <sup>4</sup>Recover Injury Research Centre, Menzies Health Institute Queensland, Griffith University, Gold Coast, Australia

R5-6, Meeting Room C4.2, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

To explore the attitudes and beliefs of healthcare practitioners about whiplash guidelines.

### Design:

Online survey and focus group discussions.

### Methods:

Participants were healthcare practitioners from NSW and QLD. The survey (n=95) investigated acceptance of key messages in the guidelines which were reported using descriptive statistics. Focus group discussions (N=28) explored perceptions of whiplash, use of guidelines in practice and key messages. Discussions were recorded, transcribed, and interpreted using thematic analysis.

### Results:

Survey results [N(%)Strongly agree/Agree] indicated support for key messages related to: assessment 72 (75.79%), routine radiology 78 (82.11%), and first-line treatments 74 (77.9%). There was less support for restricting the use of second-line treatments 57 (60%) and timeframes for referral to a specialist 33 (48.5%). Focus group participants demonstrated good awareness and general acceptance of the key messages of the guidelines. However, an emergent theme was that in many cases this acceptance was conditional, and the caveats were in some cases inconsistent with the central themes of the guideline. Acceptance of the guidelines was therefore somewhat superficial regarding recommendations about classification, acceptance of first line treatments and the role of manual therapies. There was also a perception that the guidelines applied mostly to those with good prognosis and specific guidance for complex/high risk patients was lacking.

### Conclusion/Key Practice Points:

- In future revisions of the guidelines and dissemination strategies, more attention might be given to explaining the themes underpinning the guidelines.
- More attention might also be paid to challenging beliefs, practices and approaches that are inconsistent with these themes.

## PELVIC ORGAN PROLAPSE AND THE ABILITY TO CONTRACT THE PELVIC FLOOR MUSCLES FOR NEPALI WOMEN ATTENDING AN OUTPATIENT GYNAECOLOGY CLINIC

**Caagbay D<sup>1</sup>**, Raynes-Greenow C<sup>1</sup>, Turel F<sup>1</sup>, Dangal G<sup>2</sup>, Black K<sup>1</sup>

<sup>1</sup>The University of Sydney, Sydney, Australia, <sup>2</sup>Kathmandu Model Hospital, Kathmandu, Nepal

R5-6, Meeting Room C4.2, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

To evaluate the ability of Nepali women to perform a correct pelvic floor muscle (PFM) contraction and determine any associations with age, parity, body mass index (BMI) and pelvic organ prolapse (POP)

### Design:

Cross-sectional study

### Method:

Parous women ≥18 years attending the outpatient gynaecology clinic in Kathmandu completed the baseline questionnaire and had a pelvic examination including the pelvic organ prolapse quantification system (POP-Q) and Modified Oxford Scale (MOS). Good PFM strength was defined as MOS >3 and correct contraction

an upward squeeze without breath holding or co-contraction. For statistical analysis chi-square and logistic regression was used.

#### Results:

One hundred and twenty women were assessed, mean age  $39 \pm 9.9$ SD years, births  $3 \pm 1.4$  and BMI  $26 \pm 4.5$ . There were 88 (73%) women with a POP-Q stage  $\geq 2$  but only 18 (15%) reported feeling POP symptoms. Many participants demonstrated the correct contraction ( $n=86$ , 72%) and 57% ( $n=68$ ) had good PFM strength but only 52% ( $n=63$ ) were able to demonstrate both. Statistical analysis showed no associations between the ability to perform a good PFM contraction and the participants' age, parity, BMI or POP stage.

#### Conclusion/Key Practice Points:

- Even though there was a high prevalence of POP in our sample population few reported experiencing symptoms
- Half of the participants demonstrated both a correct contraction and good PFM strength regardless of their age, parity, BMI and POP stage
- Performing regular PFM exercise may help increase strength and muscle bulk to help support the pelvic organs and reduce the risk of further descent.

#### USE OF NON-INVASIVE VENTILATION IN EARLY PHYSICAL TRAINING FOR PATIENTS WITH ACUTE ON CHRONIC RESPIRATORY DISEASES: A SYSTEMATIC REVIEW

**Choi T<sup>1</sup>**, Choo K<sup>2</sup>, Tsang H<sup>1</sup>, To Y<sup>1</sup>, Chow K<sup>1</sup>, Chung K<sup>3</sup>

<sup>1</sup>Physiotherapy Department, North District Hospital, Hospital Authority, Sheung Shui, Hong Kong,

<sup>2</sup>Department of Medicine, North District Hospital, Hospital Authority, Sheung Shui, Hong Kong, <sup>3</sup>Hospital Chief Executive Office, North District Hospital, Hospital Authority, Sheung Shui, Hong Kong

R5-6, Meeting Room C4.2, October 20, 2017, 11:40 AM - 12:40 PM

#### Aim:

To examine the effect of non-invasive ventilation in early physical training for patients with acute on chronic respiratory diseases

#### Design:

Systematic review

#### Method:

Literature search was performed in June 2016 using manual search and electronic databases MEDLINE, CINAHL, PubMed, Cochrane Library and PsycInfo. Initially 178 articles were identified. After screening, two studies were included.

#### Results:

Two randomized controlled trials involving 43 participants were included.

##### 1) Exercise tolerance

Menadue et al. found participants performed six-minute walk test with non-invasive ventilation significantly increased total distance comparing to walking with oxygen alone ( $p = 0.006$ ). Dyer et al. reported patients exercising with non-invasive ventilation significantly increased exercise tolerance time comparing to those who exercise without non-invasive ventilation ( $p = 0.04$ ).

##### 2) Isotime oxygen saturation

Menadue et al. demonstrated there was significant increase in isotime oxygen saturation by 5% on average when exercising with non-invasive ventilation ( $p = 0.001$ ). Dyer et al. found participants desaturated less when exercising with non-invasive ventilation ( $p \leq 0.001$ ).

##### 3) Isotime dyspnoea

Menadue et al. found it was reduced significantly in six-minute walk test with non-invasive ventilation ( $p = 0.028$ ). In Dyer et al.'s study, there was no significant difference found between exercise groups with or without non-invasive ventilation ( $p = 0.62$ ).

Conclusion/Key Practice Points:

- Current evidence appeared to support the use of non-invasive ventilation during early physical training in patients with acute-on-chronic respiratory diseases.
- Further studies with larger sample size would help to confirm the benefits of non-invasive ventilation in improving exercise tolerance.

**STANDING BALANCE POST TOTAL KNEE ARTHROPLASTY: SENSITIVITY TO CHANGE ANALYSIS FROM FOUR TO TWELVE WEEKS IN 466 PATIENTS**

**Clark R<sup>1</sup>**, Seah F<sup>2</sup>, Poon C<sup>2</sup>, Chong H<sup>2</sup>, Tan J<sup>2</sup>, Mentiplay B<sup>1</sup>, Pua Y<sup>2</sup>

<sup>1</sup>University Of The Sunshine Coast, Buderim, Australia, <sup>2</sup>Department of Physiotherapy, Singapore General Hospital, Singapore, Singapore

R5-6, Meeting Room C4.2, October 20, 2017, 11:40 AM - 12:40 PM

Aim:

Little is known about how static standing balance changes post total knee arthroplasty (TKA). The primary aim of this study was to examine the sensitivity to change of center of pressure (COP) variables post-TKA. The secondary aim was to compare the sensitivity of these measures to standard clinical assessments of maximum knee extension strength and fast pace gait speed.

Design:

Longitudinal follow-up

Method:

466 participants performed instrumented double-limb standing balance tests with eyes open at four and 12 weeks post-TKA. Measures of COP standard deviation, amplitude, root mean square, path length, detrended fluctuation analysis (DFA) and signal frequency content for the medial-lateral (ML) and anterior-posterior (AP) axes were examined.

Results:

Significant decreases in total path length, ML variables related to sway velocity and AP signal complexity and frequency were observed. Inter-session Cohen's d effect size (ES) revealed the strongest effect was for high velocity ML path length, with a 12% decrease in this rapid sway. This variable, along with AP mean instantaneous frequency and AP DFA, were the only ones significantly different with effect sizes >0.20 and non-redundant (Spearman's rho <0.75). The ES of COP-derived variables (maximum = 0.45) were lower than gait speed (1.40) and knee extensor strength (1.54).

Conclusion/Key Practice Points:

- Increased high velocity ML sway is present at four compared to 12 weeks post-TKA.
- This may provide increased challenges to the postural control system at a time coinciding with reduced strength levels, which could have implications for physical function during activities of daily living.

**PHYSIOTHERAPY FOR A DOG WITH POLYRADICULAR NEURITIS**

**Goff L**

<sup>1</sup>Hip Sport Spine Physiotherapy, Toowoomba, Australia, <sup>2</sup>Active Animal Physiotherapy, Toowoomba, Australia, <sup>3</sup>University of Queensland, Gatton, Australia

R5-6, Meeting Room C4.2, October 20, 2017, 11:40 AM - 12:40 PM

Aim:

To present the case history of physiotherapy for a dog with polyradicular neuritis

Design:

Case study

**Method:**

A Siberian Husky cross was diagnosed with polyradicular neuritis and referred to me by a veterinarian for 'water exercise'. The dog was referred six weeks after developing the symptoms and was tetraplegic, but could maintain sternal lying for short intervals. No intervention had been provided, except for taking food and water to the dog and the owners providing self-directed range of motion exercises for the dog's limbs. The dogs' status had not progressed over the six weeks following diagnosis. Five physiotherapy treatments involving education to owner, manual therapy and electrotherapy were delivered over a further six week period.

**Results:**

At the end of a six week period, the dog was able to walk with minimal assistance from the owners.

**Conclusion/key practice points:**

- Five physiotherapy treatments provided to a dog with polyradicular neuritis and stable symptoms resulted in the dog progressing from a tetraplegic status to ambulatory status within six weeks.

**SECONDARY SKIN REACTIONS AND POSSIBLE KOEBNER'S PHENOMENON FROM NEEDLING IN A PHYSIOTHERAPY ACUPUNCTURE PATIENT**

**Gabel C<sup>1</sup>**

<sup>1</sup>Griffith University; Coolum Physiotherapy, Coolum Beach, Australia

R5-6, Meeting Room C4.2, October 20, 2017, 11:40 AM - 12:40 PM

**Aim/s:**

To highlight the incidence of negative effects including Koebner's phenomenon from acupuncture and dry needling (ADN) in clinical settings

**Designs:**

Single prospective case study in a private patient

**Methods:**

A 28 year old female patient with a 2-week history of non-specific calf pain was treated with ADN as part of a whole program. The subjective examination suggested symptoms were a combination of delayed onset muscle soreness (DOMS) and 'grade 1' calf strain following repeated walks on soft sand and stairs. Objective examination with muscle testing and palpation confirmed this. A twitch response was elicited through the gastrocnemius with DN at five separate points. Adjunct treatments included massage, stretching, systemic and local retained-points acupuncture plus electrotherapy and home exercises for range, stretching and graded strength.

**Results:**

At day-3 the negative skin effect and possible low grade 'Koebner's phenomenon' was evident with a weal, itchiness and point swelling in lines. The likely cause is reaction to stainless steel which contains Chromium and Nickel or Ethyl Oxide sterilisation gas. Treatment provided immediate symptom relief including capacity to calf raise and run plus reduced palpation tenderness and return to recreational activity with minor persistent symptoms.

**Conclusions/Key Practice Points:**

- Negative skin related side-effects are not common from ADN but do occur
- Pre-treatment discussion should include known skin reactions and a history of Koebner's phenomenon
- Warnings should be provided to patients and therapist be aware of this potential for individuals with fair skin or known sensitivity to allergies.

## IMPROVED RESPONSE TO PHYSIOTHERAPY AFTER 48-HOUR INFUSION OF ANALGESICS

**Nicholson H<sup>1</sup>**

<sup>1</sup>*Whole Family Health, St Marys, Australia*

R5-6, Meeting Room C4.2, October 20, 2017, 11:40 AM - 12:40 PM

### Background:

Animal physiotherapists are often presented with complex cases, many of which have co-morbidities that make their veterinary and physiotherapy management difficult. In one such case, a 6-year-old male neutered 78 kg Newfoundland with severe hip and elbow dysplasia and cranial cruciate ligament disease had plateaued in his response to physiotherapy, so was referred to a veterinary specialist anaesthetist.

### Aims / Objectives:

To increase awareness amongst participants of new methods of pain management for complex cases.

### Approach:

The presenter will use photographs, videos and objective measures to describe the dog's pre- and post-infusion function and physiotherapy techniques used. Details of the infusion will also be described.

### Conclusion / Key Practice Points: Participants will have an awareness of:

- Advanced physiotherapy techniques to treat canine hip dysplasia and cranial cruciate ligament disease, including custom-made orthoses, class IV laser, walking frame gait training and whole body vibration;
- Advanced veterinary techniques for the management of hip dysplasia and cranial cruciate ligament disease, including PRP injections and analgesic infusions.

## DOES PSYCHOLOGICAL HEALTH PREDICT ACUTE HOSPITAL LENGTH OF STAY FOLLOWING TOTAL KNEE REPLACEMENT? A SYSTEMATIC REVIEW.

**March M<sup>1,2</sup>**, Harmer A<sup>2</sup>, Dennis S<sup>2,3,4</sup>

<sup>1</sup>*Blacktown Mt Druitt Hospital, Western Sydney Local Health District, Blacktown, Australia*, <sup>2</sup>*Arthritis and Musculoskeletal Research Group, Faculty of Health Sciences, University of Sydney, Lidcombe, Australia*,

<sup>3</sup>*South Western Sydney Local Health District, Liverpool, Australia*, <sup>4</sup>*Ingham Institute of Applied Medical Research, Liverpool, Australia*

R5-6, Meeting Room C4.2, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

The aim of this systematic review was to determine if pre-operative psychological health in adults undergoing primary unilateral total knee replacement (TKR) affects length of stay (LOS) in the acute hospital setting.

### Design:

A systematic review.

### Method:

Medline, PreMedline, CINAHL, EMBASE, PsycInfo and Web of Science databases were searched from their inception to December 2016. Studies were included if they examined adults undergoing primary unilateral TKR, reported any pre-operative psychological health measure and reported acute hospital LOS data. The Joanna Briggs Institute Checklist for Cohort Studies was used to assess study quality. We excluded studies that failed to disaggregate data for participants undergoing TKR from those undergoing revision TKR, bilateral TKR or hip replacement. Studies that included data for those with substance abuse or cognitive impairment were also excluded.

### Results:

Five studies met inclusion criteria. Meta-analysis was not possible due to heterogeneity of pre-operative psychological assessment tools. Four studies were high quality. Three studies reported that worse psychological health led to increased length of stay in the acute hospital setting.

#### Conclusion/Key Practice Points:

- It is likely that worse psychological health leads to increased acute hospital length of stay.
- Pre-operative assessment of psychological health may add accuracy to existing prediction tools for length of stay in the acute hospital.
- Physiotherapists are well positioned to screen candidates for TKR for psychological health issues, and make appropriate referrals to mental health services.
- Future research needs to examine physiotherapist-delivered physical and psychological skills training to address holistic health needs.

#### DOES RESILIENCE PREDICT ACUTE HOSPITAL LENGTH OF STAY IN ADULTS AFTER TOTAL KNEE REPLACEMENT?

**March M**<sup>1,2</sup>, Dennis S<sup>2,3</sup>, Harmer A<sup>2</sup>, Kirby A<sup>4</sup>, Thomas B<sup>1</sup>

<sup>1</sup>Blacktown Mt Druitt Hospital, Western Sydney Local Health District, Sydney, Australia, <sup>2</sup>Faculty of Health Sciences, University of Sydney, Sydney, Australia, <sup>3</sup>South Western Sydney Local Health District, Liverpool, Australia, <sup>4</sup>Clinical Trials Centre, University of Sydney, Sydney, Australia

R5-6, Meeting Room C4.2, October 20, 2017, 11:40 AM - 12:40 PM

#### Aim:

We hypothesise that low resilience on the Brief Resilience Scale pre-operatively will be associated with a longer hospital stay after total knee replacement (TKR).

#### Design:

Prospective cohort study across two sites.

#### Method:

100 participants undergoing primary unilateral TKR were recruited from pre-operative physiotherapy classes at Blacktown Mt Druitt Hospital. Baseline data collection was completed pre-operatively, and follow-up performed at two weeks, six weeks and six months post-operatively. Data collection included demographics, resilience, knee-related function (WOMAC), quality of life, leg strength and clinical data. Preliminary descriptive data analysis was performed.

#### Results:

Pilot data is presented for 35 participants. Demographic and baseline functional data demonstrate this cohort is representative of the TKR population (mean age 69.7 years, 71% female, 60% right knees, mean BMI 33.1, knee function (WOMAC) mean 37.6, SD 17.7). Mean hospital stay was 6.2 days (SD 2.2), and 51% of patients had an acceptable stay under five calendar days. 26% of patients had low resilience (scores less than three). At baseline, preliminary data analysis indicates those with low resilience had higher BMI, worse quality of life, reduced leg strength, worse knee function and longer hospital stay compared to those with high/normal resilience.

#### Conclusions/Key Practice Points:

- It is feasible for physiotherapists to use routine psychological skills measures in pre-operative orthopaedic assessments.
- Understanding the impact of resilience on TKR outcomes will lead to more targeted physiotherapy treatment programs before and after surgery.
- Addressing resilience and preventing longer hospital stay improves financial and opportunity costs for hospitals.

## OUR GRADUATE WORKFORCE - PROMOTING ADAPTABILITY, CONFIDENCE AND RESPONSIVENESS TO CLINICAL DEMAND

**Parslow S**

*<sup>1</sup>Eastern Health, Burwood, Australia*

R5-6, Meeting Room C4.2, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

Design an education program for graduate physiotherapists to enable an agile, adaptable and flexible workforce that can respond to clinical demand in an acute hospital setting. This program is called the Hugs program (Heads Up Grade Ones).

### Design:

Grade two physiotherapists were requested to identify the key areas in an acute hospital where graduates need to respond to clinical demand and new complexities daily. On survey the key areas identified were managing discharge planning, post-operative orthopaedics, deteriorating patients, the acute medical patient, prioritisation, the emergency short stay presentation and managing key equipment. The grade two staff developed presentations and practical sessions aligned to these topics.

### Method:

The sessions were held from week two to four of the grade one rotation. Each session duration up to 45 minutes. At the conclusion of the series the participants completed an online survey identifying the value of the sessions and their confidence levels. Each acute site developed a similar program but tailored to the individual site's clinical requirements. The program continues into its third series. The grade one staff are expected to attend all sessions and will be exposed to repeat sessions.

### Results:

Early survey results demonstrate that the grade one staff value these sessions and their confidence in moving to other areas as per clinical demand is improving.

### Conclusion:

The program is in place in three acute sites for each rotation. Grade one staff identify new information at each session and report being able to better support new graduate staff.

## ACCURACY OF A NOVEL TWO-DIMENSIONAL METHOD TO ASSESS PELVIS MOTION DURING MOVEMENT CONTROL TESTS OF THE LUMBO-PELVIC-HIP COMPLEX

**Window P<sup>1,2</sup>**, McGrath M<sup>3,4</sup>, Hodges P<sup>1</sup>, Russell T<sup>1</sup>, Grote R<sup>4</sup>, Tucker K<sup>5</sup>, O'Leary S<sup>1,2</sup>

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*<sup>2</sup>Physiotherapy Department, Royal Brisbane and Women's Hospital, Queensland Health, Brisbane, Australia,*

*<sup>3</sup>School of Chemistry, Physics and Mechanical Engineering, Faculty of Science and Engineering, Queensland University of Technology, Brisbane, Australia, <sup>4</sup>Queensland Motion Analysis Center, Royal Brisbane and Women's Hospital, Queensland Health, Brisbane, Australia, <sup>5</sup>School of Biomedical Sciences, The University of Queensland, Brisbane, Australia*

R5-6, Meeting Room C4.2, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

To assess the agreement between measures of pelvis motion during movement control tests of the lumbo-pelvic-hip complex made with a novel method using two-dimensional recordings from two video cameras, and the gold standard method using three-dimensional motion capture.

### Design:

Reliability and validity study.

### Method:

Ten participants (five with low back pain, five controls) performed three repetitions of movement control tests of the lumbo-pelvic-hip complex (single-leg stance, single-leg squat, and single-leg land) with simultaneous recording using two video cameras (front and side view) and a three-dimensional motion capture system (Vicon, USA). Test-retest reliability of measures of pelvic motion in the sagittal, frontal and transverse planes

(tilt, obliquity and rotation, respectively) were evaluated for each measure using intraclass correlation coefficients (ICC). The agreement and measurement error between measures made with each system were assessed using absolute agreement ICC and Root Mean Square Error (RMSE).

#### Results:

As most measures showed excellent test-retest reliability for both two-dimensional (average ICC 0.79) and three-dimensional (average ICC 0.77) measurement systems the average of three repetitions was used to assess agreement between methods. Measures made from video showed moderate to excellent agreement with measures made using Vicon for pelvic motion in all planes and all tasks (ICC range 0.61-0.99) with small RMSE (average 2.2°, range 0.9°-3.1°).

#### Conclusion/Key Practice Points:

- Video-based methods of motion capture are commonly used in clinical settings to quantify movement control.
- Measures of pelvic motion made with video have similar test-retest reliability and accuracy as measures made with three-dimensional motion capture systems.

### THE ASSOCIATION BETWEEN PRE-ARTHROSCOPIC DYNAMIC BALANCE WITH HIP STRENGTH, TRUNK STRENGTH AND RANGE OF MOTION IN PEOPLE WITH HIP PAIN.

Freke M<sup>2</sup>, **Semciw A**<sup>2,1</sup>, Kemp J<sup>1</sup>, Sims K<sup>2</sup>, Russell T<sup>2</sup>, Weinrauch P<sup>2</sup>, Crossley K<sup>1</sup>

<sup>1</sup>La Trobe University, Bundoora, Australia, <sup>2</sup>University of Queensland, St Lucia, Australia

SPA6A, Meeting Room C4.9, October 20, 2017, 11:40 AM - 12:40 PM

#### Aim:

Describe the association between pre-arthroscopic dynamic balance, with hip strength, trunk strength and range of motion in people with hip pain.

#### Design:

Cross-sectional

#### Methods:

108 participants (46 female) with hip or groin pain scheduled for hip arthroscopic surgery were recruited from two orthopaedic surgery clinics (Brisbane and Melbourne). Dynamic balance was assessed using the star excursion balance test in three directions; antero-lateral (AL), postero-lateral (PL) and postero-medial (PM), with the stance limb being the symptomatic limb. Hip strength (flexion, extension, abduction, adduction, internal rotation, external rotation), trunk strength (side plank duration) and hip range of motion (internal rotation and flexion) were also assessed. Univariate and multivariate backwards stepwise regression models were used to assess the relationship between pre-surgical dynamic balance, with hip strength, trunk strength and hip range of motion.

#### Results:

AL direction: internal rotation range of motion, extension strength and abduction strength explain 47% of the variability in dynamic balance, when adjusted for height ( $p < 0.001$ ). PL direction: Adduction strength and gender (male has greater reach) explains 56% of the variability in dynamic balance when adjusted for internal rotation strength, height, weight and age ( $p < 0.001$ ). PM direction: Adduction strength explains 47% of the variability in dynamic balance when adjusted for side-plank duration, internal rotation strength and height ( $p < 0.001$ ).

#### Conclusion:

- Hip strength is significantly associated with dynamic balance; particularly hip adduction, abduction and extension. These may provide avenues for targeted intervention.
- Hip flexion range of motion is not associated with dynamic balance.

## THE PHYSIOFIRST STUDY: A PILOT RANDOMISED CLINICAL TRIAL FOR THE EFFICACY OF A TARGETED PHYSIOTHERAPY INTERVENTION FOR FEMOROACETABULAR IMPINGEMENT

**Kemp J<sup>1</sup>**, Coburn S<sup>1</sup>, Jones D<sup>1</sup>, Crossley K<sup>1</sup>

<sup>1</sup>*La Trobe University, Bundoora, Australia*

SPA6A, Meeting Room C4.9, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

Determine the feasibility of a randomised clinical trial (RCT) investigating the efficacy of a targeted physiotherapy intervention for femoroacetabular impingement (FAI).

### Design:

Pilot double-blind RCT.

### Methods:

24 participants (17 women; age 37±8 years; body mass index = 25.4±3.4 kg/m<sup>2</sup>) with symptomatic FAI were recruited. Interventions were delivered over 12 weeks and both groups received 8x one:one physiotherapy sessions and 12x supervised gym sessions. The targeted physiotherapy group received hip, trunk strengthening and functional retraining. The control group received standardised stretching. Both groups received manual therapy, progressive physical activity, and education. Primary outcome was feasibility. Secondary outcomes included hip pain and function (International Hip Outcome Tool (IHOT-33) patient-reported outcome) and hip muscle strength. Between-group effect sizes (ES) for change in pain, function, and hip muscle strength were calculated, and sample size for a full-scale RCT presented. Post-study interviews determined improvements to future studies.

### Results:

24 out of 50 eligible patients (50%) were eligible and were randomised and 3 patients (12%) lost to follow-up. The between-group mean difference (95% confidence intervals) in change scores were: IHOT-33 (15(-9 to 38)), hip adduction strength (0.24(0.01 to 0.46)Nm/kg and hip extension strength (0.08(-0.19 to 0.35)Nm/kg) favouring the targeted physiotherapy group. The ES for between group differences in change scores were 0.61(IHOT-33), 1.03(adduction strength) and 0.30(extension strength).

### Conclusion/Key Practice Points:

- Full-scale RCT of physiotherapy for FAI is feasible. A targeted physiotherapy program may have large positive effect on adductor strength and pain and function.
- Adequately powered and improved studies may increase the effectiveness physiotherapy for FAI.

## THE RELATIONSHIP BETWEEN HIP MUSCLE STRENGTH AND HIP AND KNEE KINEMATICS IN ASYMPTOMATIC FEMALES: A SYSTEMATIC REVIEW

**Dix J<sup>1,2</sup>**, Marsh S<sup>1</sup>, Malliaris P<sup>2</sup>

<sup>1</sup>*Peninsula Sports Medicine Group, Edithvale, Australia*, <sup>2</sup>*Monash University, Frankston, Australia*

SPA6A, Meeting Room C4.9, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

To perform a systematic review of literature investigating the relationship between hip muscle strength and knee valgus during tasks in asymptomatic females.

### Design:

A systematic review of studies investigating the relationship between hip strength and knee valgus.

### Method:

Studies were included if they investigated the relationship between hip strength (measured with isometric or isokinetic dynamometry) and knee valgus (measured with 3D motion capture software or other validated system) during dynamic tasks in asymptomatic females aged 18 and over. Study quality was assessed using the Joanna Briggs Institute Checklist for Cohort Studies.

#### Results:

Six studies reported no relationship between hip strength and knee valgus range. Thirteen studies identified an association between greater knee valgus range was reduced hip strength (abductor strength in seven studies, external rotator strength in four studies, extension strength in three studies), and these studies were more likely to investigate a more demanding task. Three studies found that greater hip strength was associated with greater knee valgus range.

#### Conclusions/Key Practice Points:

- There is conflicting evidence for hip muscle strength having a relationship with knee valgus range.
- This may be partly explained by heterogeneity of study design and assessment procedures.
- In particular, the demand of the task may influence the relationship between hip strength and knee valgus.

### LOW BACK PAIN IN ROWING: AN ISSUE AT EVERY LEVEL OF THE SPORT

**Wilkie K<sup>1</sup>**

<sup>1</sup>BODYSYSTEM Physio, Hobart, Australia

SPA6B, Meeting Room C4.5, October 20, 2017, 11:40 AM - 12:40 PM

Low back pain is the most common injury reported in the literature for both elite and developing rowers (Bahr et al 2004, Teitz 2002). Rowing Australia has been able to reduce the training time lost to low back pain in the elite environment but has not been able to reduce the incidence and prevalence of low back pain. The greatest pre-disposing factor for low back pain in rowers is a previous episode of low back pain (Teitz 2002). Considering that most elite rowers have already experienced an episode of low back pain before getting to the elite level, every effort must be taken to prevent low back pain in rowers throughout their development years. Prevention of low back pain in developing rowers may also result in a reduction in attrition from the sport due to this injury and a focus on healthy low backs for life.

This presentation will explore the evidence for risk factors associated with low back pain in rowing with an emphasis on addressing the known risks that are changeable at both an elite and development level.

#### Key Practice Points:

- Participants should be able to identify risk factors for any rower presenting with low back pain and be enabled to address such factors.
- Participants should also acquire a sound understanding of the risk factors that can be addressed to prevent low back pain in developing rowers.

### HOW TO PRESCRIBE EXERCISE IN PATELLO-FEMORAL JOINT PAIN

**Barton C**

SPA6B, Meeting Room C4.5, October 20, 2017, 11:40 AM - 12:40 PM

Strong evidence indicates exercise therapy including resistance training can improve pain and function in patients with patellofemoral pain (PFP). A number of variables can be manipulated in the prescription of exercise, and the exact prescription will impact on physiological responses, and therefore likely clinical outcomes. Our recent systematic review indicates that the level of detail described in published programs reported to be effective is insufficient to do allow clinicians to replicate them in clinical practice. During this 'how to' session, I will outline how currently published PFP literature can be combined with accepted exercise prescription principles to tailor and optimise your clinical outcomes.

## AN ARGUMENT FOR COMPETENCY-BASED TRAINING IN PELVIC FLOOR PHYSIOTHERAPY PRACTICE

**Frawley H<sup>1,2</sup>**

<sup>1</sup>Department of Physiotherapy, Monash University, Melbourne, , <sup>2</sup>Centre for Allied Health Research and Education, Cabrini Health, Melbourne,

WMPH6, Meeting Room C4.4, October 20, 2017, 11:40 AM - 12:40 PM

Pelvic floor dysfunction has been described as 'a silent epidemic', affecting many people in the community yet under-recognised and insufficiently managed. There is evidence that pelvic floor physiotherapy can manage many of these disorders, however a competency framework to guide and inform pelvic floor physiotherapy training and practice is lacking. Whilst being within the scope of physiotherapy practice, the assessment and management of the pelvic floor complex is not addressed as a core component of most entry-to-practice physiotherapy programs, in contrast with the knowledge and skills that physiotherapists graduate with in core areas of clinical practice. This results in a registration-competency gap, and the need for post-graduation training to ensure clinicians are appropriately skilled to practise safely and effectively in this area. In addition, there are potential ethical and legal issues unique to this area of physiotherapy practice to be considered. We use a series of clinical scenarios to highlight the domains of knowledge, skills and communication required for practice in this area. We propose a framework for the future which defines competence in pelvic floor physiotherapy to provide clarity to clinicians about their clinical, ethical and legal obligations to the public, our referrers and third party payers.

### Key Practice Points

- Case vignettes will be presented which highlight the complex and interrelated areas of knowledge, technical skills, clinical reasoning and communication required for optimal care in clinical practice, including recognition of the impact of psychology, emotion and past experience on a patient's presentation.

## INVESTIGATION OF CONTINENCE CARE IN REGIONAL AUSTRALIA: ADHERENCE TO BEST PRACTICE, THE PATIENT JOURNEY AND PATIENT SATISFACTION

**Graetz H<sup>1,2</sup>**, Briffa K<sup>2</sup>, Thompson J<sup>2</sup>

<sup>1</sup>The Royal Hospital for Women, Sydney, Australia, <sup>2</sup>Curtin University, Perth, Australia

WMPH6, Meeting Room C4.4, October 20, 2017, 11:40 AM - 12:40 PM

### Aim:

To evaluate differences in continence care provided by a continence clinic and a surgical outpatient department in a regional Australian health service.

### Design:

A retrospective clinical audit and patient survey were conducted across case records from 2011-2013.

### Methods:

163 records from continence clinic (n=91) and surgical outpatients (n=72) were reviewed to assess a) adherence to best practice according to NICE guidelines; b) the patient journey including referral characteristics and length of episodes of care and c) patient satisfaction.

### Results:

Adherence to best practice was 89% at continence clinic compared with 19% at surgical outpatients for meeting more than 50% of the individual criteria. Regarding the patient journey, patients with urge urinary incontinence (76% versus 35%) and urinary tract infection (15% versus 3%) were more likely to be referred to the continence clinic than the surgical outpatient department ( $p<0.003$ ) but proportions with stress urinary incontinence did not differ between clinics (77% versus 88%;  $p=0.54$ ). Episodes of care were longer at the continence clinic (11 versus 8 months,  $p<0.01$ ), but patients from the surgical outpatient department were more likely to require multiple episodes (53% versus 35%;  $p=0.01$ ). Neutral patient satisfaction was reported by 68% of respondents while the proportion of patients who were very satisfied was greater in the surgical outpatient department (22%) than the continence clinic (4%).

Conclusion/Key practice points:

- This study has identified key service differences that may inform improved service utilization and right care, right time, right place healthcare.

#### WHO SEES A PHYSIOTHERAPIST FOR MASTITIS?

**Cooper M<sup>1</sup>**, Lowe H<sup>2</sup>, Prandji P<sup>3</sup>, McArdle A<sup>3</sup>

<sup>1</sup>*Inform Physiotherapy & Pilates, Fairfield, Australia*, <sup>2</sup>*Through Life Physiotherapy, Warragul, Australia*,

<sup>3</sup>*Monash University, Churchill, Australia*

WMPH6, Meeting Room C4.4, October 20, 2017, 11:40 AM - 12:40 PM

Aim:

To understand the demographics and estimate the prevalence and severity of symptoms in women with inflammatory breast conditions in lactation presenting to physiotherapists.

Design:

A retrospective case audit within physiotherapy settings was taken to gather data on symptoms and demographic characteristics.

Methods:

Women who presented with breast inflammation to two private physiotherapy practices (one metropolitan, one regional) between 2011 and 2013 were invited to participate. Demographics, symptoms and response to treatment data were extracted from de-identified files.

Results:

125 patients (metropolitan = 94; regional = 31) were identified and a total of 53 patients consented (42% response rate). The average maternal age was 35.2 years (range 21 to 40 years). The average age of the infant was 17.4 weeks (range 1 to 99 weeks). Presenting symptoms varied widely with no difference between right and left breasts. The areas of the breast most likely affected were upper and lower lateral. Treatment resulted in an immediate reduction in symptoms with resolution usually within three treatments.

Conclusion/Key Practice Points:

- Women with inflammatory breast conditions are likely to present to physiotherapists later in their lactation journey (average age of infant 17 weeks) compared to other health care providers where 2-3 weeks post-partum is commonly reported.
- The number of inflammatory symptoms and severity of each symptom vary between women.
- Our study shows the lateral aspect of the breast is most likely to be affected, suggesting a target area for treatment. In-rooms response to treatment and resolution within three treatments, suggest a framework for planning treatment.

#### PHYSIOTHERAPY MANAGEMENT OF PELVIC ORGAN PROLAPSE IN AUSTRALIA

**McPherson K<sup>1,2</sup>**, Nahon I<sup>1</sup>, Waddington G<sup>1</sup>

<sup>1</sup>*University of Canberra, Canberra, Australia*, <sup>2</sup>*Charles Sturt University, Orange, Australia*

WMPH6, Meeting Room C4.4, October 20, 2017, 11:40 AM - 12:40 PM

Aim:

To examine how physiotherapists manage pelvic organ prolapse in Australia.

Design:

An online survey was developed with Survey Monkey to effectively explore how Australian physiotherapists treat pelvic organ prolapse.

Method:

The survey composed of 19 open and closed questions that took less than ten minutes to complete. Requests were sent out through the social media sites and physiotherapy networks from April to October 2016.

#### Results:

There were ninety respondents to the survey. The majority of respondents had post graduate qualifications and worked in senior positions. Nearly all respondents assessed pelvic floor muscle strength and the size of the levator hiatus. Few respondents assessed lumbar spine, pelvic girdle and the sacroiliac joints for dysfunction or performed motor control tests. Management included individualised pelvic floor muscle training, lifestyle advice, manual handling advice, defecation dynamics and pessaries. Respondents suggested that there needs to be more education provided to physiotherapists pre-graduation and an increased awareness within the physiotherapy and medical profession of the role of physiotherapy in the conservative management of pelvic organ prolapse.

#### Conclusion/Key Practice Points:

- Physiotherapy management of women with pelvic organ prolapse tends to be individualised and follows current research.
- Physiotherapists managing women with pelvic organ prolapse need post graduate clinical experience and post graduate professional development to more effectively manage women with pelvic organ prolapse.
- There is a need to increase the awareness of the role of physiotherapist in the management of pelvic organ prolapse within the physiotherapy and medical professions.

### MANUAL THERAPY, EXERCISE AND BIOPSYCHOSOCIAL MANAGEMENT – WHERE DO THEY FIT IN CLINICAL PRACTICE AND EDUCATION?

#### **Mitchell T<sup>1</sup>**

<sup>1</sup>*Curtin University, School of Physiotherapy and Exercise Science, Perth, Australia*

Mini Keynote 8, Meeting Room C4.5, October 20, 2017, 1:45 PM - 3:15 PM

A current topical issue for the physiotherapy profession both in Australia and internationally is the roles of manual therapy, exercise and biopsychosocial interventions in the current landscape of physiotherapy practice. There is strong debate over evidence for and against the role of these interventions in individuals with musculoskeletal pain. This presentation will provide a perspective on contemporary clinical practice and education of our future physiotherapists in the area of musculoskeletal pain. Clinical case examples will illustrate a common sense approach to this issue.

#### Key Practice Points:

- Biopsychosocial and manual therapy are not mutually exclusive terms
- Manual therapy has an important place in contemporary clinical practice and education of our future physiotherapists
- Understanding of the effects and role of interventions for individuals with musculoskeletal pain disorders has evolved – and clinicians and educators should be aware of this
- An evidence informed approach to selecting interventions is advocated.

### UNDERSTANDING THE BIOLOGY OF MUSCLE CHANGES IN PAIN AND INJURY: WHY THE CAPACITY OF MUSCLE TO MOVE AND CONTROL IS IMPAIRED

#### **Hodges P<sup>1</sup>**

<sup>1</sup>*The University of Queensland, , Australia*

Mini Keynote 8, Meeting Room C4.5, October 20, 2017, 1:45 PM - 3:15 PM

Muscle is the effector organ of the motor system and hosts sensory receptors. The capacity of muscle is a key determinant of function and health of the musculoskeletal system. If a muscle's capacity to generate and sustain force is compromised then the capacity to move and control internal and external forces will be impaired. Although structural muscle changes are ubiquitous in many conditions involving pain and injury, the underlying biology is only beginning to be understood. Recent work in humans and animals has probed the cellular and neural mechanisms. These studies reveal a complex interaction between different mechanisms that vary over time. Although muscle atrophy and inhibition of spinal circuits is apparent acutely after injury, the subacute phase is characterised accumulation of fat and connective tissue (fibrosis) and a slow-to-fast transition of muscle fibres, but no reduction of muscle size (whole muscle or muscle cells). Recent studies suggest a role for pro-inflammatory cytokines in the muscle (TNF and IL $\beta$ ), which appears to be related to

polarisation of macrophages to the pro-inflammatory subtype. This may be secondary to changes in muscle metabolism as a consequence of muscle fibre changes. The chronic phase involves more diffuse muscle, fat and connective tissue changes. Inflammation and fibrosis are highlighted as a major factor in the pathophysiology of many metabolic conditions that are a growing issue in the modern world. Exercise has the potential to target many of these mechanisms but the type of exercise will differ depending on the time-course.

**Key Practice Points:**

- Changes in muscle structure and behaviours and the underlying mechanisms are dynamically regulated over time and are likely to demand different approaches to exercise
- Like many conditions affecting modern society, the immune system is implicated in muscle remodelling, and this has implications for the impact of exercise and other lifestyle interventions.

## **SPECIFIC EFFECTS OF NON- SPECIFIC EFFECTS OF INTERVENTIONS FOR PAIN**

**Bialosky J<sup>1</sup>**

<sup>1</sup>*University of Florida, Gainesville, United States*

Mini Keynote 8, Meeting Room C4.5, October 20, 2017, 1:45 PM - 3:15 PM

Physical therapy approaches to treating patients in pain are traditionally based on the biomedical model with the implication identification and correction of peripheral impairments results in pain relief. In reality, treatment responses to varying interventions are similar despite vastly different underlying theories. Furthermore, common impairments frequently driving the clinical decision making process often fail to mediate treatment outcomes. Subsequently, contextual factors related to the act of receiving treatment may be as influential as the specific intervention on the associated outcomes. This presentation will highlight contextual factors capable of influencing clinical outcomes related to the patient, the provider, and the interaction of the two within the healthcare environment. Specifically, patient and provider expectation and preferences as well as shared decision making to account for each in the clinical decision making process will be emphasized.

**Key Practice Points: Participants will gain**

- An appreciation of the the multiple factors surrounding a specific intervention capable of influencing clinical outcomes in patients presenting with pain, understanding of the influence of their own and patient's beliefs on clinical outcomes, and approaches to measure and leverage these beliefs to influence clinical outcomes.

## **FUTURE FUNDING MODELS: GETTING THE BEST 'BANG' FOR THE BUCK**

**Landry M**

Mini Keynote 9, Meeting Room C4.4, October 20, 2017, 1:45 PM - 3:15 PM

Driven by several factors ranging from a rapidly aging population with projected functional decline, to increase access to advanced medical and surgical technologies, the global demand for rehabilitation services is growing markedly faster than the available supply. Viewed from a neo classical economic perspective, this scenario is referred to as economic imbalance. The consequences of this imbalance can have important social and financial impact on people, their families, and their communities, but there is also a 'spillover' effect into the larger health system because as physiotherapy needs going unmet, simple rehabilitation-sensitive conditions can develop into lifelong disabilities, often forcing individual to seek resource intensive care in expensive institutional settings. In order to readjust economic imbalance, one can either attempt to reduce 'demand' through prevention and other such public and population health interventions, or work on the 'supply' side of the equation. Supply side strategies can include increasing overall funding, or to attempt to maximize the effectiveness of the financing that already exist.

In this presentation, we will explore this latter concept of economic efficiency, specifically related to how physiotherapy services are currently financed (mostly on a fee-for-service basis) and how public and private health systems have implemented disruptive innovation to alter the mechanisms by which financing flows from payer to provider. In this presentation, we will also apply Nash's economic theory on Governing Dynamics to better understand what future physiotherapy financing models should look like, in order to create

benefit to physiotherapists. We conclude by making suggestions for increased efficiency, and how physiotherapists will need to position themselves at the leading edge of funding reforms so as to lead, and not follow, in implementing solutions to balance future demand and supply curves.

#### CHIEVING GOALS AND OUTCOMES IN NDIS: REASONABLE AND NECESSARY EXPLAINED

**Hawkins M, Locke J**

Mini Keynote 9, Meeting Room C4.4, October 20, 2017, 1:45 PM - 3:15 PM

What does Reasonable and Necessary mean? This session will provide physiotherapists with an insight into what NDIS planners consider when making decisions about funded supports. The session will include practical advice on how to structure reporting and recommendations with respect to the identified participant goals within their plan. We will review how physiotherapists can ensure they are providing outcome driven intervention, that maximises function and social and economic participation for the participant, within the reasonable and necessary framework of the NDIS.

#### IMPROVING PATIENT OUTCOMES THROUGH UNDERSTANDING AND TARGETING BELIEFS AND BEHAVIOURS?

**Bunzli S, Sterling M, O'Sullivan P, Singh S**

Mini Keynote 10, Meeting Room C4.11, October 20, 2017, 1:45 PM - 3:15 PM

There is a growing body of evidence that psychological factors and beliefs play an important role in presentation and recovery after injury. A person's level of symptoms and disability may have less to do with pathological processes and tissue damage and more to do with their beliefs, emotional and behavioral responses to their health complaint. Physiotherapists play a key role in informing illness perceptions and driving health behaviors. They have the capacity to both negatively and positively impact on a person's health outcome. Understanding these processes and adopting positive strategies to deal with illness perceptions, enables health care providers to empower their clients to take a positive journey to manage their health.

Samantha will discuss Health behavior theories and present a clinically useful framework to understand how physiotherapy patients make sense of their symptoms and how sense-making processes can be targeted to change patient behaviour.

Michele will present and discuss preliminary results of studies of acute whiplash injury to assist in the discussion as to "How physiotherapists can integrate treatment of these factors into their 'usual' physiotherapy care of patients at risk of developing chronic pain"

Peter will present a case study of a patient presenting with disabling low back pain to highlight how a clinician can empower a person in pain to take back control of their life.

And Sally will join us in the panel discussion to reflect on how understanding and addressing patient behaviours allows clinicians to engage patients in rehabilitation programs.

#### HIGH PERFORMANCE LOWER-LIMB REHABILITATION: COMBINING NEUROLOGICAL, MUSCULOSKELETAL AND SPORTS PERSPECTIVES

**Williams G, Delahunt E, Vicenzino B**

Mini Keynote 11, Meeting Room C4.1, October 20, 2017, 1:45 PM - 3:15 PM

This session brings together three experts from neurological, sports and musculoskeletal fields to provide topical and clinically applicable perspectives on different aspects of lower limb rehabilitation. Prof Bill Vicenzino will discuss patello-femoral joint pain; Prof Gavin Williams will discuss high level rehabilitation following acquired brain injury; and A Prof Eamonn Delahunt will discuss the complexity of ankle syndesmosis injuries in sport.

## IS TOO MUCH SITTING KILLING YOU?

**Brown W<sup>1</sup>**

<sup>1</sup>Centre for Research on Exercise, Physical Activity and Health, School of Human Movement and Nutrition Sciences, University of Queensland

Mini Keynote 12, Meeting Room C4.8, October 20, 2017, 1:45 PM - 3:15 PM

In the first decade of the 20th century, Australian data (from the Australian Longitudinal Study on Women's Health and from the AusDiab study) were among the first in the world to illustrate the ill-effects of too much sitting. Research from these, and numerous additional observational and intervention studies, saw rapid worldwide growth in sedentary behaviour research. Rapid dissemination of these research findings led to widespread promotion of the slogan 'sitting is killing you.'

This presentation will consider key research findings from recent years, to illustrate the nature and strength of the relationships between sitting and health. Most of the data will be drawn from prospective cohort studies (including the Australian Longitudinal Study on Women's Health, which has been tracking the health of more than 40,000 women for 20 years). Results from a meta-analysis of data from more than 1m adults, followed for between 2 and 18 years, will also be explained, to illustrate the joint effects of sitting time and physical activity on mortality, and to provide critical insight and debate on the question of whether 'sitting is killing you'. The outcome will be improved understanding of the National Physical Activity and Sedentary Behaviour Guidelines, which should be used to inform both personal and professional practice.

## POOL EDGE ASSESSMENT AND OUTCOMES MEASURES FOR THE AQUATIC PHYSIOTHERAPIST

**Cuesta A<sup>1,2</sup>**

<sup>1</sup>Cátedra de Fisioterapia, Universidad de Málaga, Instituto de Investigación Biomédica de Málaga (IBIMA), , Spain, <sup>2</sup>Faculty of Health at the Queensland University of Technology, , Australia

AG7, Meeting Room C4.9, October 20, 2017, 3:50 PM - 4:35 PM

Consensus-based standard for the selection of assessment and outcomes measures is needed into Aquatic Physiotherapy Space to test the best practice.

Aim:

Offer a core set of assessment and outcomes measures for aquatic physiotherapist.

Design and Method:

A narrative review with pragmatic approach of the state of art about functional and clinimetric assessment tools transferable to aquatic physiotherapy. The COSMIN checklist have been used to evaluate the methodological quality of studies on measurement properties and completed with practical knowledge of aquatic physiotherapy experience.

Results:

Patient reported outcomes and objective measures are required to assess the responsiveness of adequate aquatic physiotherapy. Specific aquatic measures of neuromuscular and aerobic capacities combined with general clinimetric constructs could be a preliminary ambulatory index like pool edge outcomes measures. Autonomy and safety must be guaranteed during aquatic physiotherapy into core set measures.

Conclusion/Key Practice Points:

- A core set of measures has emerged of the current scientific literature and aquatic physiotherapy practice.
- Developments of new aquatic measurements instruments are necessary as well as test / adapt some measures to different clinical populations and levels of severity.

## FACTORS AFFECTING LONG TERM OUTCOMES FOLLOWING SURGICAL MANAGEMENT OF CRANIAL CRUCIATE LIGAMENT INSUFFICIENCY IN DOGS

Simcock J<sup>5</sup>, McGowan C<sup>6</sup>, **McCarthy E<sup>1,2,3</sup>**, Monk M<sup>4</sup>

<sup>1</sup>Institutes of Veterinary Science, Faculty of Health and Life Science, University of Liverpool, , United Kingdom, <sup>2</sup>Jockey, Horse & Hound Physiotherapy, , Australia, <sup>3</sup>Bundoora Extended Care Centre, Northern Health, , Australia, <sup>4</sup>Dogs In Motion Canine Rehabilitation, , Australia, <sup>5</sup>Southpaws Speciality Surgery for Animals, Hospital and Consulting Suites, , Australia, <sup>6</sup>Institutes of Veterinary Science and Ageing and Chronic Disease, Faculty of Health and Life Science, University of Liverpool, , United Kingdom

APG7, Meeting Room C3.4, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

To measure long term outcomes in dogs with cranial cruciate ligament (CCL) insufficiency and to investigate factors affecting outcome.

### Design:

Telephone based survey and retrospective study

### Methods:

Owners of dogs from a single referral centre, < 8 years of age, diagnosed with CCL insufficiency between May 2013 and November 2015, without concurrent orthopaedic or neurological conditions were invited to participate in a telephone survey. Outcome was assessed based on the Helsinki Chronic Pain Index. A variety of clinical data was recorded and owners were asked about recovery, including their use of physiotherapy.

### Results:

139 dogs were included, with median follow-up 16 months. Median age and bodyweight were 52 months and 32 kg respectively. 50.4% had bilateral injury and the most prevalent breeds were the Labrador Retriever and Golden Retriever. Median HCPI score was 4, with a higher HCPI associated with contralateral injury ( $P < 0.006$ ), contralateral injury ( $P < 0.004$ ) and continued use of medication or analgesia post operatively ( $P < 0.001$ ). Bodyweight at the date of surgery was correlated to HCPI score ( $r = .25$ ,  $P < 0.011$ ). Dogs whose owners reported they did not return to normal exercise had a higher HCPI score ( $P < 0.001$ ).

### Conclusion:

In this group of large breed dogs with CCL insufficiency where concurrent conditions had been excluded, bodyweight and bilateral disease were associated with a poorer outcome but median HCPI score was 4 (good outcome), indicating that CCL ligament surgery combined with postoperative physiotherapy has a good long term outcome.

## EFFECT OF TAPING ON GAIT IN SIBERIAN HUSKIES

**Batterham S<sup>1</sup>**

<sup>1</sup>Active Animal Physiotherapy, Perseverance, Australia

APG7, Meeting Room C3.4, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

To determine the effect of kinesiology tape on walking gait of Siberian huskies using RS Scan pressure mat.

### Design:

Pilot study

### Method:

Two Siberian Huskies were weighed, then walked across the RS Scan pressure mat to determine footfall pressures during normal gait. Simultaneous video was taken to correlate footfalls with the data obtained by the RS scan. The Huskies were walked across the pressure mat again with kinesiology tape applied to limit flexion of the forelimb tarsal joint. Gait data was compared between taped and un-taped condition for each dog.

#### Results:

Temporal gait parameters were altered with un-taped compared to taped conditions in both subjects. RS Scan data was clearer with the heavier subject (32kg compared to 28kg), and showed additional differences in foot strike patterns of the taped forelimb compared to the same limb during un-taped gait.

#### Conclusion/Key Practice Points:

- The RS Scan provides a feasible method to collect gait parameter data in dogs and clearly records changes between normal and altered gait in medium and large breed dogs heavier than 30kg.
- Kinesiology taping of the distal forelimb can alter gait parameters in Siberian Huskies.

#### LUNG INFECTION PREVENTION POST SURGERY MAJOR ABDOMINAL WALL WITH PREOPERATIVE PHYSIOTHERAPY (LIPPSMACK-POP) TRIAL: 12-MONTH MORTALITY AND SUB-GROUP EFFECTS

**Boden** <sup>1,2,8</sup>, Skinner <sup>E2,3</sup>, Browning <sup>L2,3</sup>, Reeve <sup>J4,5</sup>, Anderson <sup>L5</sup>, Hill <sup>C6</sup>, Robertson <sup>I7,8</sup>, Denehy <sup>L2</sup>

<sup>1</sup>Physiotherapy Department, Launceston General Hospital, Launceston, Australia, <sup>2</sup>The University of Melbourne, Melbourne, Australia, <sup>3</sup>Division of Allied Health, Western Health, Melbourne, Australia,

<sup>4</sup>Department of Physiotherapy, Auckland University of Technology, Auckland, New Zealand, <sup>5</sup>Physiotherapy Department, North Shore Hospital, Auckland, New Zealand, <sup>6</sup>Physiotherapy Department, North West Regional Hospital, Burnie, Australia, <sup>7</sup>School of Health Sciences, University of Tasmania, Launceston, Australia, <sup>8</sup>Clifford Craig Foundation, Launceston, Australia

CRP7, Meeting Room C4.4, October 20, 2017, 3:50 PM - 4:35 PM

#### Aims:

1) To determine if the reduction in postoperative pulmonary complications (PPC) attributable to respiratory physiotherapy education and training prior to upper abdominal surgery effects 12-month mortality; 2) to explore sub-group effects to primary and secondary outcomes.

#### Design:

Multi-centre, double-blinded, randomised controlled trial with concealed allocation and intention-to-treat analysis.

#### Method:

Four-hundred-and-forty-one patients awaiting upper abdominal surgery received a physiotherapy assessment and information booklet within six-weeks of surgery. Intervention group participants received an additional respiratory physiotherapy education and training session. Primary outcome was PPC. Secondary outcomes included length of stay (LOS) and 12-month mortality.

#### Results:

Pre-operative physiotherapy halved PPC (HR 0.48, 95% CI 0.31 to 0.76:  $p < 0.001$ ). Participants with PPC were five-times more likely to die within 12-months (OR 5, 95% CI 3 to 11). No difference in 12-month mortality between treatment groups (control group 11% v intervention group 7%,  $p = 0.48$ ) was found. Sub-group analyses found stronger between-group reductions in PPC, LOS, and mortality in participants who; had colorectal surgery, were male, at high-risk of PPC, or, treated by an experienced physiotherapist (mean LOS reduction 3.2 days, 95% CI 0.4 to 6.0,  $p = 0.03$ ; 12-month mortality, RR 0.2, 95% CI 0.1 to 0.6,  $p = 0.03$ ).

#### Conclusion:

Pre-operative physiotherapy prevents PPC and reduces LOS following upper abdominal surgery. This effect strengthened in certain sub-groups. Mortality was not statistically different between-groups across the study population, although sub-group benefits were detected; in particular, education by experienced physiotherapists appeared to confer a significant mortality reduction.

Trial registration: ANZTRN 12613000664741

## EFFECTS OF EXERCISE TRAINING USING OXYGEN VERSUS MEDICAL AIR IN PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD): A RCT

**Alison J**<sup>1,2</sup>, McKeough Z<sup>1</sup>, Jenkins S<sup>3,4</sup>, Holland A<sup>5,6</sup>, Hill K<sup>4</sup>, Morris N<sup>7,8</sup>, Leung R<sup>9</sup>, Spencer L<sup>10</sup>, Hill C<sup>11,12</sup>, McDonald C<sup>12,13</sup>

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CRP7, Meeting Room C4.4, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

To determine whether supplemental oxygen during exercise training was more effective than medical air in improving exercise capacity and quality of life in people with COPD whose oxygen saturation fell to less than 90% during the six-minute walk test.

### Design:

Randomised controlled trial with participant, trainer and assessor blinding.

### Methods:

Participants were randomised (independent, concealed allocation) to either an Oxygen Group or Air Group. Both groups received the respective gas from a concentrator via nasal prongs at five litres/minute during exercise training of treadmill and cycle exercise, three times/week for eight weeks. Primary outcomes were endurance shuttle walk test and Chronic Respiratory Questionnaire-Dyspnoea domain.

### Results:

111 participants (60 males, mean (SD) age 69 (7) years, forced expiratory volume in one second 46 (17)% predicted) were recruited and 97 completed (Oxygen Group = 52; Air Group = 45). Within-group changes at eight weeks were significant for endurance shuttle walk test (Oxygen Group mean difference 162 seconds (95% CI 80 to 244); Air Group mean difference 147 seconds (95% CI 59 to 235); and Chronic Respiratory Questionnaire-Dyspnoea: Oxygen Group mean difference 0.7 points (95% CI 0.4 to 1.0); Air Group mean difference 0.6 points (95% CI 0.3 to 0.9). There were no between group differences in either of these outcomes ( $p > 0.5$  for both).

### Conclusions:

- Exercise capacity and quality of life improved in both groups, with no greater benefit from training with oxygen than medical air.
- Availability of oxygen may not be necessary during exercise training for COPD.

## BUBBLE-POSITIVE EXPIRATORY PRESSURE DEVICE FOR SPUTUM CLEARANCE IN PEOPLE WITH NON-CYSTIC FIBROSIS BRONCHIECTASIS: A RANDOMISED CROSS-OVER STUDY

**Santos M**<sup>1,2</sup>, Milross M<sup>2</sup>, McKenzie D<sup>3</sup>, Alison J<sup>2,4</sup>

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CRP7, Meeting Room C4.4, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

To compare the effect of bubble-positive expiratory pressure (Bubble-PEP) device with active cycle of breathing technique (ACBT) and Control (quiet sitting) on sputum clearance in people with bronchiectasis.

### Design:

Prospective, randomised cross-over trial with assessor blinding.

### Methods:

Participants with bronchiectasis (diagnosed by CT) with stable disease and daily sputum production were recruited. Participants attended on three separate days at the same time within a 10-day period. On each occasion 30-minutes of one intervention was performed followed by 60-minutes quiet sitting. The order of interventions (Bubble-PEP, ACBT, Control) was randomised and allocation concealed. Primary outcome was wet weight (WetWt) in grams (g) of expectorated sputum during 30-minutes intervention, 60-minutes-post intervention, and total-WetWt (30-minutes + 60-minutes-post).

### Results:

35-participants (11 males, mean (SD) age 75 (8) years, FEV1 72 (20) % predicted) were recruited and 34 completed the study. Bubble-PEP had greater sputum WetWt than Control at 30-minutes (2.1 (2.4) g vs 1.1 (2.1) g respectively;  $p < 0.05$ ; 60-minutes-post (2.5 (3.9) vs 1.4 (2.8);  $p < 0.05$ ) and total-WetWt (4.5 (5.6) vs 2.5 (4.4);  $p < 0.05$ ); and had greater sputum WetWt than ACBT at 60-minutes-post (2.5 (3.9) vs 1.2 (1.6);  $p < 0.05$ ). ACBT had greater WetWt than Control at 30-minutes (2.6 (3.5) vs 1.1 (2.1);  $p < 0.05$ ) and total-WetWt (3.8 (4.8) vs 2.5 (4.4);  $p < 0.05$ ). There was no significant difference in WetWt between Bubble-PEP and ACBT at 30-minutes.

### Conclusion/Key-Practice-Points:

- Sputum WetWt was significantly greater with Bubble-PEP than Control at all time periods, and greater than ACBT at 60-minutes-post.
- Bubble-PEP could be an alternative sputum clearance intervention.

## A STRUCTURED APPROACH TO IMPROVING CULTURALLY APPROPRIATE PHYSIOTHERAPY PRACTICE AND ACCESS TO PHYSIOTHERAPISTS FOR ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLES

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EDU7A, Meeting Room C4.11, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

To combat Aboriginal and Torres Strait Islander peoples' life expectancy of around ten years less than other Australians, and the 2009 evidence showing that the physiotherapy profession en masse was not engaged with Aboriginal health, and that Aboriginal people were unlikely to see a physiotherapist, as well as being under-represented in the physiotherapy profession.

### Design:

The APA committed to a Reconciliation Plan. The plan was one of the APA's first steps to help close the gap in life expectancy.

**Method:**

The plan included activities like cultural awareness training, celebration of cultural events, improved engagement of physiotherapists working in Aboriginal and Torres Strait Islander health and conference content. It also provided opportunities to engage with key stakeholders and embed cultural safety into APA practice.

**Results:**

Importantly, the plan facilitated a gradual change in culture within the APA. The APA is now recognized as more culturally aware, and has developed a voice on Aboriginal health issues. We have joined the steering committee of the Close the Gap campaign, and are now being approached to partner with Aboriginal health agencies. There is more cultural diversity in our member magazine and in conference content.

**Conclusion:**

Physiotherapists are now more engaged in Aboriginal and Torres Strait Islander health, and the APA is planning to launch a second Reconciliation Action Plan in 2017. Vital to the next plan are strong voices at all levels of leadership to drive culture change, strong relationships between the APA and Indigenous organisations and strong interest from APA members.

### PHYSIOTHERAPY STUDENTS' REFLECTIONS ON THE APA'S RECONCILIATION ACTION PLAN 1

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EDU7A, Meeting Room C4.11, October 20, 2017, 3:50 PM - 4:35 PM

**Aim:**

To evaluate a reflection task designed to assess physiotherapy students' 'working knowledge of factors that contribute to and influence the health and well-being of Aboriginal and Torres Strait Islander ... communities' (Physiotherapy Board of Australia, 2015, p 10).

**Design:**

Final year DPT students were required to reflect on and critique the APA's Reconciliation action plan 1 (RAP1). This learning outcome aligned with 1) the profession's practice threshold requirement to have knowledge of factors that shape Indigenous health and wellbeing, and 2) the APA's Indigenous advocacy activity.

**Method:**

Thematic analysis was completed on 30 randomly selected assignments to determine students' engagement with and critical response to issues in Indigenous health and RAP1.

**Results:**

Themes around history listening, professional behaviour, and reciprocity of relationships emerged. Students identified significant personal and professional knowledge gaps with consistent arguments for more professional education and action in Indigenous healthcare.

**Conclusion:**

This reflection task was judged as an authentic opportunity for students to engage with the professions discourse on Indigenous health and its advocacy activity in Indigenous wellbeing.

**Key Practice Points:**

- It is essential to design learning outcomes that align with all threshold requirements defined by the profession.
- Assessment tasks can provide students with safe space and time to read about and reflect on the complex factors that influence Indigenous health and wellbeing.
- The APA's policy documents are an excellent source of material for students' reflection, promoting understanding of their own professional advocacy role in 'Closing the Gap'.

## STUDENT PREFERENCES FOR LEARNING PRACTICAL SKILLS

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EDU7B, Meeting Room C4.6, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

To compare two formats of practical class instruction to determine student preference, perception of feedback and confidence.

### Design:

Repeated measures study design.

### Methods:

Second year undergraduate and first year graduate entry Masters students learned practical musculoskeletal physiotherapy skills in two formats. In format 1, groups of approximately 42 students practiced skills with feedback from three tutors over a 2-hour period. Skills that students found difficult were demonstrated to the class as needed. Format 2 consisted of 45 minutes of independent skill practice, 15 minutes of questions/demonstrations with one tutor, followed by 60 minutes of skill practice with tutor feedback. During this last hour, approximately 10 students were grouped with one tutor. Student preference, perception of feedback amount and quality, and confidence in performance were evaluated using a questionnaire.

### Results:

The majority of students (85% of undergraduate students and 93% of graduate entry Masters students) preferred to learn practical skills in format 2. Students perceived they received more feedback and better quality of feedback in practical class format 2 ( $p < 0.001$ ). They also indicated higher task confidence after this format ( $p < 0.001$ ).

### Conclusion/Key practice points:

- Students prefer quality over quantity. They prefer less contact time with tutors and a lower student to tutor ratio over more contact time with tutors and a larger student to tutor ratio.
- Students are more confident in their practical skills and perceive they have received better feedback in a small group (10:1) learning environment, even when contact time with the tutors is less.

## TRAINING PHYSIOTHERAPY STUDENTS TO EDUCATE PATIENTS; A RANDOMISED CONTROLLED TRIAL

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EDU7B, Meeting Room C4.6, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

The purpose of this study was to evaluate the effect of a patient education training program on physiotherapy students' self-efficacy and skills in the area of patient education.

### Design:

Single blinded, randomised controlled trial

### Method:

164 final year physiotherapy students were randomised to an intervention group that received a training intervention, or to a control group (no training). The intervention group participated in a 3.5h training workshop about patient education that included video observation, practice with simulated patient actors and structured feedback. Self-efficacy was assessed immediately before and after the intervention or control; clinical performance was assessed by a blinded rater using video-recorded standardised clinical examinations.

#### Results:

83 students were randomised to the intervention group and 85 students to the control group. There were no differences between groups at baseline. Only the intervention group improved significantly on the self-efficacy measure. The intervention group performed significantly better than the control group for nine of the eleven performance items, with significantly higher scores overall.

#### Conclusion:

A patient education workshop embedded within the physiotherapy curriculum enhances physiotherapy student self-efficacy and skills in this important area of practice. Use of such focussed approaches is recommended for physiotherapy training to enhance student skills and outcomes related to patient care. The maintenance of effects of such training and the implications for clinical practice skills is warranted.

### IMPROVING INTER-EXAMINER RELIABILITY IN PRACTICAL EXAMINATIONS WITH A VIDEO-BASED APPROACH TO PRE-EXAMINATION CONSENSUS MODERATION

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EDU7B, Meeting Room C4.6, October 20, 2017, 3:50 PM - 4:35 PM

#### Aim:

To determine consistency and inter-rater reliability of viva examiner marks following a video-based approach to pre-examination consensus moderation.

#### Design:

Pre-test post-test reliability.

#### Method:

In an effort to improve examiner recognition of performance standards and improve inter-examiner reliability we designed an innovative approach to practical examination consensus moderation for an orthopaedic physiotherapy course. In this course, students perform a 20-minute viva to demonstrate their management of an orthopaedic patient. In 2015, viva performances were videorecorded ( $n = 13$ ) and reviewed by a panel of examiners ( $n = 3$ ). The panel discussed and came to an agreement on the student performance. At the next iteration of the course, the same panel members reviewed and marked another sample of videorecorded performances ( $n = 10$ ). Consistency and interrater reliability were examined for each iteration (before and after the video-based moderation activity) using Cronbach's alpha and intra-class correlation coefficients (ICC) based on a two-way mixed method for absolute agreement.

#### Results:

Prior to video-based moderation, consistency for viva examination marks across the three examiners was low (Cronbach's alpha = 0.387) and interrater reliability was poor (ICC = 0.399, 95% CI 0.000 to 0.805).

Following the video-based moderation activity, however, consistency was high (Cronbach's alpha = 0.836) and interrater reliability was good (ICC = 0.837, 95% CI 0.522 to 0.956).

#### Conclusion/Key Practice Points:

- A video-based approach to consensus moderation in an orthopaedic physiotherapy course improved inter-examiner agreement to acceptable levels.
- Such moderation practices should be encouraged for practical examinations where multiple examiners are employed.

## PAIN MANAGEMENT IN THE OLDER PERSON: SOME GENERAL PRINCIPLES FOR APPLYING GUIDELINES AND PROTOCOLS

**Jones L**

GPA7, Meeting Room C3.6, October 20, 2017, 3:50 PM - 4:35 PM

The understanding of the human pain experience continues to evolve at a fast rate. Guidelines and protocols are at risk of become obsolete unless the frequency of their review keeps pace. With reference to the Aged Care Funding Instrument, this session will present a commentary on three pain management principles that should be considered in the care of the older person with pain. These general principles are derived from recent research evidence and current concepts of pain and include (1) recognise the person's life journey, (2) identify ways of reducing threat and (3) identify ways of increasing safety. It is hoped that the principles can be used to assist the clinician with their interpretation and application of guidelines and protocols relevant to the older person with pain.

Key practice points:

Participants will be able to:

- Describe the need for well-constructed and up-to-date guidelines
- Explain how current concepts of pain can be incorporated into their clinical application of guidelines and protocols
- Constructs arguments to advocate for optimal treatment for older people with pain.

## IMPROVE HEALTH LITERACY RESPONSIVENESS; IMPROVE CLIENT OUTCOMES

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GPA7, Meeting Room C3.6, October 20, 2017, 3:50 PM - 4:35 PM

Background:

The developing model of health literacy places a greater emphasis on health care provider responsibility, organisational self-examination, and improving accessibility and equity within the health care environment. Physiotherapists are well placed to support people to understand and use health information; however, skill development in this area is considered a post-graduate competency.

Objective:

This presentation will discuss the role that physiotherapists have in providing information to clients in a way that supports a biopsychosocial approach to practice. We have customised a series of workshops for allied health professionals to work with their clients to improve goal setting and client outcomes, based on the OPHELIA approach to health literacy.

Key Practice Points:

- Strategies for applying health literacy principles to practice, such as using inclusive language, development of written materials like handouts and using teach-back in consultation, can be easily implemented to support client understanding and decision making.
- Tools for measuring self and client health literacy and improving responsiveness will be presented.

## WHY WE STILL NEED SELF-REPORT MEASURES OF PHYSICAL ACTIVITY

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MPA7B, Meeting Room C4.8, October 20, 2017, 3:50 PM - 4:35 PM

Background:

Self-reported measures of physical activity (PA) have been used for many years to assess the levels of PA in population groups, trends in PA over time, and relationships between PA and health outcomes. They are also used to identify the determinants of specific types of PA, such as walking for transport, or physical activity in different occupational environments. It is acknowledged that self-report measures may be subject to social desirability and recall biases, and that their reliability and validity for measuring PA in individuals is

not perfect. In most research studies, and in some national surveillance systems, self-reported measures are starting to be replaced by the more reliable and valid objective measures.

#### Objectives:

The objective is to consider the pros and cons of continuing with self-report measures of PA, or switching to objective measures, for various purposes, including for population surveillance of PA levels in Australia. This will include consideration of the evidence used to develop the current guidelines, and the difficulties of assessing compliance with these guidelines with currently available objective measures.

#### Key Practice Points:

Delegates will develop their understanding of

- The current Australian physical activity and sedentary behaviour guidelines, and
- The importance and utility of both 'self-perceptions' and objectively monitored PA duration and intensity in assessing compliance with these.

### ACTIVITY MONITORS ARE VALID AND RELIABLE TOOLS TO MEASURE GROSS ARM MOVEMENT IN ADULTS FOLLOWING DISTAL RADIUS FRACTURE

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MPA7B, Meeting Room C4.8, October 20, 2017, 3:50 PM - 4:35 PM

#### Aim:

To examine the validity and reliability of an activity monitor to estimate upper limb activity after distal radius fracture.

#### Design:

A laboratory-based study and data from a community-based randomised controlled trial (RCT).

#### Method:

Fifteen adults performed five common upper limb activities during two laboratory testing sessions, one week apart to compare the measurement properties of an accelerometer-based activity monitor (ActivPAL fixed to proximal wrist), relative to three-dimensional motion analysis (criterion reference VICON). An additional 17 adults with a distal radius fracture allocated to exercise and advice, or to advice only in an RCT, wore activity monitors for three consecutive days at baseline and six weeks post-intervention.

#### Results:

There were moderate to large ( $r=0.54-0.82$ ), significant positive correlations between activity monitor counts and motion analysis for some gross upper limb activities: grocery shelving [affected:  $r=0.82$ , unaffected:  $r=0.73$ ]; floor sweeping [affected:  $r=0.54$ , unaffected:  $r=0.59$ ] and table dusting [affected:  $r=0.29$ , unaffected:  $r=0.70$ ]. Correlations and reliability for fine hand motor activities such as typing were poor. Relative reliability was excellent in affected and unaffected wrists for crank ergometer [ICC(2,1)=0.91, ICC(2,1)=0.88, respectively], grocery shelving [ICC(2,1)=0.83, ICC(2,1) = 0.89, respectively] and table dusting [ICC(2,1)=0.77, ICC(2,1)=0.83, respectively]. Hypothesis testing of group equivalence in the trial was not confirmed.

#### Conclusion/Key Practice Points:

- Activity monitors may be valid and reliable measures therapists can use to quantify gross arm activity to monitor injury recovery after distal radius fracture.
- Activity monitors are not sufficiently valid and reliable to monitor fine hand and wrist movements after distal radius fracture.

## LEVERING DIGITAL TECHNOLOGIES TO HELP TRANSFORM HEALTH CARE FOR AUSTRALIANS WITH MUSCULOSKELETAL CONDITIONS

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MPA7B, Meeting Room C4.8, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

EHealth and mHealth technologies are increasingly becoming part of contemporary health ecosystems. We aim to demonstrate how digital technologies can help bridge the escalating burden-service gaps in musculoskeletal health and build physiotherapy and interdisciplinary workforce capacity to support the implementation of contemporary musculoskeletal Models of Care. A Model of Care is a vehicle to drive evidence through policy and into practice: it describes how to operationalize evidence-based management and support contextually-relevant implementation by consumers, clinical teams and health systems.

### Design:

Various robust, pragmatic research designs have been applied across this program of work.

### Methods:

In this presentation, we overview our group's translation-oriented research on leveraging digital technologies, including methodologies aligned to implementation science, to support contemporary musculoskeletal Models of Care.

### Results:

Using specific research project examples, we outline how we have implemented digital technologies to build capacity (health system, health workforce, and consumer and clinician capacity) and support improved evidence-based care for consumers with musculoskeletal conditions. We review outcomes data from these pragmatic, implementation projects. We make recommendations about the critical role that digital technologies can play in supporting the transformation of physiotherapy-relevant musculoskeletal care and how this transformation aligns with contemporary health policy frameworks.

### Conclusion:

Digital technologies offer physiotherapists an opportunity to connect all Australians, regardless of their location with reliable, evidence-based resources to support their musculoskeletal health care, to mitigate care disparities and to complement current health services.

### Conclusion/Key Practice Points:

- Digital technologies can help drive transformation of musculoskeletal care for health consumers and their treating clinicians

## TELEPHONE- AND INTERNET VIDEO-DELIVERED EXERCISE-BASED CARE FOR KNEE AND/OR HIP OSTEOARTHRITIS: THE PERCEPTIONS OF PHYSIOTHERAPISTS AND PATIENTS

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MPA7B, Meeting Room C4.8, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

Investigate perceptions of physiotherapists and people with hip and/or knee osteoarthritis about the remote delivery of exercise therapy.

### Design:

Two cross-sectional surveys.

#### Method:

Physiotherapists and people with hip and/or knee osteoarthritis each completed an online survey ascertaining their perceptions about delivering and receiving (respectively) exercise care via telephone and video over the internet. Data were analysed by calculating response proportions and evaluating levels of agreement with each statement.

#### Results:

217 physiotherapists and 330 people with osteoarthritis completed the survey. People with osteoarthritis were in most agreement about both modes of delivery saving time, being easy to use, and maintaining privacy. There was no majority agreement with liking the lack of physical contact, willingness to pay, belief that telephone-delivery would be effective, and belief that a physiotherapist could adequately monitor osteoarthritis over the telephone. Amongst physiotherapists there was consensus agreement that telephone-delivered care would maintain patient privacy and save time, however there was no majority agreement for the remaining 10 of 16 statements. There was most agreement video-delivered care would save time, maintain privacy, and be convenient for patients. Most agreed with all other perception statements about video-delivered care, except for liking no physical contact.

#### Conclusion:

People with knee and/or hip osteoarthritis hold mostly positive perceptions, however there was concern about the lack of physical contact with the physiotherapist. Physiotherapists agree telerehabilitation offers time-saving and privacy advantages, and perceive video-delivered care more favorably than telephone-delivered services. However, most do not like the lack of physical contact with either service model.

### CAN ACCESSIBLE TECHNOLOGIES ADD VALUE TO THE ASSESSMENT OF ANTERIOR STABILITY FOLLOWING STROKE?

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NNG7A, Meeting Room C4.7, October 20, 2017, 3:50 PM - 4:35 PM

#### Aim:

To investigate the utility of instrumenting the Functional Reach and Limits of Stability tests with low-cost sensor technologies. Specifically, to examine test-retest reliability and correlations between variables.

#### Design:

Single-centre cross-sectional study.

#### Method:

Thirty post-stroke individuals attended two testing sessions, one week apart. Participants performed two trials each of the Functional Reach and Anterior Limits of Stability. A force platform (Wii Balance Board) was used to collect centre of pressure variables (i.e. anterior displacement) and a depth-sensing camera (Microsoft Kinect) to collect height and joint movements (i.e. trunk flexion angle, anterior shoulder and hip displacement).

#### Results:

Participants were (mean±SD) 68±15 years old, 70% male, 44±14 months post stroke, and 28.4±7.3 cm reach distance. Test-retest reliability was excellent (ICC = 0.79 to 0.96) for all variables. Anterior centre of pressure displacement from the Limits of Stability was most strongly correlated (Pearson's) with anterior hip ( $r = 0.95$ ) and shoulder ( $r = 0.81$ ) displacement during the same test; and with anterior centre of pressure ( $r = 0.76$ ) and shoulder displacement ( $r = 0.74$ ) during the Functional Reach. Reach distance was less strongly correlated with centre of pressure displacement during both tests ( $r = 0.69$ ).

#### Conclusion/Key Practice Points:

- Reach distance is influenced by height and can be achieved by different strategies (e.g. rotation and squatting).
- Kinect-derived, height-adjusted hip and shoulder displacements can be reliably measured and provide a more accurate reflection of anterior stability.

- Future research should further examine validity, including the associations with falls and other balance-related outcomes.

#### TRACKING THE “WHAT, WHERE AND HOW MUCH” OF POST-STROKE PHYSICAL ACTIVITY IN HIGH DENSITY ENVIRONMENTS USING CUSTOM WEARABLES AND SELF-REPORT

**Thilarajah S<sup>1,2</sup>**, Bower K<sup>1</sup>, Tan D<sup>2</sup>, Pua Y<sup>2</sup>, Williams G<sup>3,4</sup>, Koh G<sup>5</sup>, Ng Y<sup>6</sup>, Bok C<sup>6</sup>, Larik A<sup>6</sup>, Clark R<sup>1</sup>

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NNG7A, Meeting Room C4.7, October 20, 2017, 3:50 PM - 4:35 PM

##### Aim:

Wearables combined with self-report can be used to provide context on the spatial characteristics and mode of post-stroke physical activity. This study aimed to understand the characteristics of post-stroke physical activity, using a Global Positioning System unit designed for use in high-density areas in combination with an accelerometer and self-report.

##### Design:

Prospective cross-sectional study.

##### Method:

Consecutive stroke patients, who were able to walk at least 10 m with no more than minimal assistance with or without a gait aid, were recruited from an inpatient rehabilitation unit. Physical activity of 55 participants, at 3 months post discharge, was measured using the International Physical Activity Questionnaire, Activity Card Sort and wearables with an activity diary.

##### Results:

The median steps (interquartile range) per day taken by participants was 4870 (1284-8206). Only 8% of the sample engaged in greenspace exercise, 18% in active transport while 24% did walking as part of grocery or leisure shopping. There was a fair strength correlation between International Physical Activity Questionnaire and Activity Card Sort scores ( $r = 0.44$ ,  $p = 0.001$ ). Steps per day also had a fair strength correlation to Activity Card Sort ( $r = 0.43$ ,  $p = 0.003$ ) and International Physical Activity Questionnaire ( $r = 0.31$ ,  $p = 0.04$ ).

##### Conclusion/Key Practice Points:

- The majority of stroke survivors did not engage in planned exercise outdoors, with the common mode of physical activity being walking.
- A combination of outcome measures is required to understand the characteristics of post-stroke physical activity to enable targeted interventions.

#### IS IT WORTH ASSESSING MUSCLE POWER USING A HAND-HELD DYNAMOMETER AFTER STROKE? RELATIONSHIP WITH GAIT VELOCITY

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NNG7A, Meeting Room C4.7, October 20, 2017, 3:50 PM - 4:35 PM

##### Aim:

Rate of torque development has shown promise to provide a stronger link with physical function compared to strength. Current methods of assessment involve cumbersome equipment. The aim was to examine the test-retest reliability of hand-held dynamometry to assess rate of torque development following stroke and compare the contribution of strength and rate of torque development to gait velocity.

Design:  
Observational study with test-retest reliability.

Method:  
Sixty-three adults following stroke (age: 60 years, 34 male) were recruited. Gait velocity was assessed using the fast paced 10m walk test. Assessment of strength and rate of torque development were performed for seven lower limb muscle groups of both limbs with hand-held dynamometry. Intraclass correlation coefficients were calculated for reliability, Spearman's correlations were used for associations and a partial F-test was used to compare measures.

Results:  
Good to excellent test-retest reliability was shown for the assessment of strength and rate of torque development (ICCs = 0.82-0.97). Strong associations were found between strength and rate of torque development measures indicating potential redundancy ( $\rho = 0.71-0.94$ ). Despite high correlations between measures, rate of torque development failed to provide significant value over muscle strength, whereas, isometric strength of all muscle groups except one demonstrated stronger relationships with gait velocity compared to rate of torque development.

Conclusions/Key Practice Points:

- The results suggest that muscle strength explains significantly higher amounts of variance in gait velocity following stroke compared with rate of torque development.
- Further research is needed to examine relationships between dynamic measures of muscle power and gait.

## NOT ALL IMPAIRMENTS ARE CREATED EQUAL: IMPLICATIONS FOR NEUROLOGICAL CONDITIONS

**Ada L<sup>1</sup>**

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NNG7B, Meeting Room C4.10, October 20, 2017, 3:50 PM - 4:35 PM

The main motor impairments in neurological conditions are muscle weakness, incoordination, spasticity/rigidity, and contracture. However, not all impairments are of equal importance and this may differ across conditions. For example, after stroke, weakness makes an important independent contribution to disability whereas in cerebral palsy incoordination is the main determinant of disability. In Parkinson's disease, leg muscle power is more strongly related to balance and mobility than freezing of gait or dyskinesia. Furthermore, neurological conditions are extremely heterogeneous.

For example, after stroke, survivors range from being unable to walk at all right through to being able to walk at a normal speed. There is emerging evidence that interventions are not equally effective across the range of stroke survivors, ie, one size does not fit all.

This has implications for both the clinic and for future research. In the clinic, interventions need to be tailored to the individual, and perhaps walking speed can be used to direct intervention. For example, for the non-ambulatory person, mechanically assisted walking with partial weight support via an overhead harness provides the opportunity to complete large amounts of walking practice.

For those who can already walk, there is evidence from systematic reviews that treadmill walking and cueing of cadence are effective in improving walking speed and distance. In future research, systematic reviews and clinical trials should take into account the inclusion criteria of the participants investigated.

## CONSENSUS DEVELOPMENT OF A CORE SET OF MEASURES TO PROGRESS STROKE RESEARCH: THE FIRST STROKE RECOVERY AND REHABILITATION ROUNDTABLE

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NNG7B, Meeting Room C4.10, October 20, 2017, 3:50 PM - 4:35 PM

### Background:

A lack of agreed time-points and measures to examine outcomes in stroke rehabilitation and recovery trials limits our ability to progress this field. We aimed to establish a set of measurement standards to be included in all stroke recovery trials.

### Method:

Our physiotherapist-led, multidisciplinary expert international working group was one of four groups established for the first Stroke Recovery and Rehabilitation Roundtable (SRRR) convened in Philadelphia, May 2016. Over 5 stages based on decision making science techniques, we developed the core measurement set: 1. Establishment of measurement time-points; 2. Identification of stroke impairment constructs and measurement tools; 3. Establishment of desirable characteristics of a “good” measurement tool; 4. Ranking of tools based on how each tool overall met the desirable characteristics, at each measurement time point; 5. Face-to-face discussion at SRRR to finalise consensus.

### Results:

Nine key recommendations were developed, including core measures to be included at each time-point post-stroke (acute, early sub-acute, late sub-acute and chronic). We did not form consensus on kinematic/ kinetic measurements to distinguish between true recovery and compensation, pre-morbid measures of physical activity and cognition, or post-stroke participation measures.

### Conclusion/ Key Practice Points:

- To improve stroke recovery trials we urge the research community to consider adopting our recommendations in their trial design.
- We are undertaking further work to form consensus on clinical predictors and pre-stroke clinical data to be collected, as well as recommendations for additional outcome measurement tools.
- Our methodology suits core measure development in other health fields.

## THE VALIDITY OF PERFORMING THE MOVEMENT ASSESSMENT BATTERY FOR CHILDREN – 2ND EDITION VIA TELEREHABILITATION

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NPG7, Meeting Room C4.1, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

As to investigate the concurrent validity of performing the Movement Assessment Battery for Children (2nd Edition) via Telerehabilitation compared to the conventional in-person method.

### Design:

A randomised test-retest method was used to compare performance on the Movement Assessment Battery for Children (2nd Edition) between in-person and Telerehabilitation delivery.

### Method:

All typically developing children attending a primary state school in Brisbane were invited to participate. Parental consent and child assent were obtained. Children were assessed twice within one week – once via in-person delivery, and once using Telerehabilitation. Two researchers independently performed assessments either at the school (in-person) or remotely from the University of Queensland Telerehabilitation

Clinic (Telerehabilitation). The order of assessment method was randomised to control for test-retest learning effects as was the researcher who performed each assessment. All participants completed a satisfaction questionnaire.

#### Results:

Participants included children 5 to 11 years old ( $n = 59$ , males = 31). Bland-Altman limits of agreement between in-person and Telerehabilitation assessments were -3.15 to 3.22 which was smaller than a pre-determined clinically acceptable margin based on the smallest detectable change of the Movement Assessment Battery for Children (2nd Edition) of 3.8 points. Overall, participants perceived their Telerehabilitation experience positively.

#### Conclusion/Key Practice Points:

- Results confirm the concurrent validity of the administration of the Movement Assessment Battery for Children (2nd Edition) via Telerehabilitation
- Participant satisfaction of the Telerehabilitation assessment was high.
- This has implications for the future delivery of Telerehabilitation services for children who are unable to access conventional services.

### HAND PROPRIOCEPTION – A COMPREHENSIVE ASSESSMENT FOR CHILDREN AND THE ABILITY TO PREDICT FINE MOTOR FUNCTION

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NPG7, Meeting Room C4.1, October 20, 2017, 3:50 PM - 4:35 PM

#### Aims:

To characterise proprioception in typically developing children according to age, gender, and hand dominance using a new test battery; and to investigate the influence of proprioception on fine motor performance.

#### Methods:

Participants were 25 children aged 6-12 years with motor development in the typical range according to the Movement Assessment Battery for Children, second edition (MABC2). All children participated in upper limb assessment of (i) proprioceptive registration, using the Passive Movement Direction Discrimination (PMDD) test, (ii) perception, using the Neurological Sensory Motor Developmental Assessment (NSMDA), Position Sense Test (PST), and Position Matching Test (PMT), and (iii) fine motor function, using the Evaluation Tool of Children's Handwriting (ETCH) and MABC2 manual dexterity subscale (MABC2-MD). Relationships were tested using multiple regression modeling.

#### Results:

In children older than 6 years, proprioception was performed similarly regardless of age, gender or hand dominance. Wrist proprioception predicted manual dexterity (MABC2 MD:  $r = 0.44$ ). Finger proprioception predicted handwriting legibility (ETCH letter:  $r = 0.72$ ). Wrist and hand proprioception together predicted writing legibility (ETCH average:  $r = 0.52$ ; ETCH word:  $r = 0.59$ ).

#### Key Practice Points:

- This is the first comprehensive proprioception battery tested in children
- Typically developing children aged 6-12 years show similar proprioceptive performance regardless of age, gender, or hand dominance.
- Wrist, hand and finger proprioception can predict manual dexterity and handwriting legibility.
- Further psychometric testing is warranted to prepare the proprioception test battery for clinical use.

## AN INTERNATIONAL CONSENSUS STUDY FOR USE OF PAEDIATRIC LOWER LIMB NEUROLOGICAL IMPAIRMENT TESTS BY PHYSIOTHERAPISTS

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NPG7, Meeting Room C4.1, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

To gain consensus on factors perceived to influence paediatric lower limb neurological testing.

### Design:

A modified electronic Delphi technique over two sequential survey rounds.

### Method:

An expert panel of experienced paediatric neurological physiotherapy clinicians and academics (n = 34) were invited to participate. Questionnaire 1 was developed using existing literature and open-ended questions. Experts ranked statements via an electronic survey using a 1-6 Likert scale (strongly agree, agree, somewhat agree, somewhat disagree, disagree, strongly disagree). Questionnaire 2 was developed from thematic analysis of the open-ended questions and sought opinion on statements without consensus. A-priori criteria for consensus was pre-set at 65% agreement/disagreement and median and interquartile range score (25%, 75%) estimated perceived importance.

### Results:

Twenty-six experts from nine countries completed Questionnaire 1, and 24 completed Questionnaire 2. Consensus was reached on 292/316 items (92%). Experts perceived with strong agreement (>85%) and moderate importance (median = agree and interquartile range = somewhat agree-strongly agree) that variations in therapist's experience, expertise, equipment and time constraints may influence the process and outcomes of a paediatric neurological test. They also perceived with strong agreement and moderate importance that a child's developmental age, behaviour (including compliance and motivation), cognitive and language abilities could influence neurological testing.

### Conclusion/Key Practice Points:

- Physiotherapists should ensure clear documentation of procedures and results.
- This is the first study to identify factors perceived to influence paediatric lower limb neurological impairment tests
- International consensus has provided guidelines towards the development of a standardised paediatric lower limb impairment test.

## ACTIVITY PERMISSIVE WORK DESIGN REDUCES SITTING BEHAVIOUR IN OFFICE WORKERS

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OHP7, Meeting Room C4.3, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

The aim of this presentation is to report on the outcomes of two recent trials investigating the effects of (a) sit-stand desk protocols and (b) activity-based working (ABW) on work-time sitting, physical activity, and musculoskeletal discomfort in office workers.

### Design:

Trial (a) was a randomised controlled pilot study; Trial (b) was an observational study.

### Method:

Office workers employed in health and telecommunication sectors were variously recruited for separate trials. For study (a) participants were randomly allocated to either a sustained sitting (control) or to one of 3 prescribed sit-stand protocols, using a height-adjustable workstation for 4-weeks. For study (b) participants

trialled an ABW environment for 4 weeks, preceded and followed by working in their usual open plan environment. Sitting, standing, and stepping time were objectively measured by accelerometry and by self-report at baseline, and end-intervention. Secondary outcomes were musculoskeletal discomfort and work ability. Between-group differences were analysed by mixed methods.

#### Results:

(a) Use of a sit-stand desk with adherence to a prescribed sit-stand protocol reduced work sitting time by 113 minutes/8-hour workday (95% CI (147 to 79), without significantly impacting leisure time physical activity or sleep time. (b) ABW resulted in 14% lower self-reported sitting-time ( $p < 0.01$ ) and 50% less low back pain (OR 2.0, [95% CI 1.1 to 3.7]). In both trials less sitting was replaced mainly by increased standing.

#### Key Practice Points:

- Activity permissive workstations and activity permissive workplaces appear to reduce sitting time in office workers without significant adverse effects on non-work time activity.
- Long-term health benefits are currently unknown.

### THE HAPPY PEOPLE PROGRAM: A PILOT STUDY OF A MULTIMEDIA PROGRAM FOR CUSTOMER-FACING EMPLOYEES

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OHP7, Meeting Room C4.3, October 20, 2017, 3:50 PM - 4:35 PM

#### Aims:

1) What characteristics do customer-facing retail employees in Australia report in regards to levels of energy and activity, sleep, and stress? (2) Does, Happy People, a 4-week multimedia application deliver useful strategies for managing health and wellbeing in the workplace and at home?

#### Design:

Single group pilot study

#### Methods:

A pilot study was conducted throughout retail outlets nationally of a major Australian telecommunications company. Pre-and post-program data were collected via anonymous surveys and application engagement captured using background analytical software.

#### Results:

Pre-and post-program surveys on 482 and 360 participants respectively, with application engagement data from 1100 participants. Over 77% of participants were aged under 30 years. Less than 17% reported meeting physical activity guidelines. Over 40% reported often feeling tired or exhausted, 43% reported back pain and 41% headaches. Sleep was commonly disturbed by worries about personal issues (65%) and work (51%). Over 30% reported feeling overwhelmed with stress some of the time. Higher stress was associated with increased physical complaints, particularly headaches ( $r_s = .391$ ,  $p = .000$ ), and difficulty in managing customers ( $r_s = .303$ ,  $p = .000$ ). Engagement in the program was high, with 72% of participants reporting that the program helped them improve overall health and wellbeing, including strategies for managing stress (63%), sleep (68%), and upset customers (69%).

#### Conclusions:

Retail employees, despite being young in age, are experiencing high levels of stress, sleep disturbance and physical complaints. A brief, interactive multimedia application was engaging and can provide useful strategies for improving health and wellbeing.

## MEASUREMENT OF DYSTONIA AND CHOREOATHETOSIS IN CHILDREN WITH DYSKINETIC CEREBRAL PALSY: A SYSTEMATIC REVIEW

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R5-7, Meeting Room C4.2, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

Identify and systematically review the psychometric properties and clinical utility of dystonia and choreoathetosis scales for children with dyskinetic cerebral palsy (CP).

### Method:

Six databases (PubMed, Medline, Embase, Proquest, CINAHL, Web of Science) were searched to identify papers reporting (i) dystonia or choreoathetosis scales with original psychometric data, (ii) for children with CP aged 0 to 18 years. Quality was evaluated by two authors using the COnsensus-based Standards for the selection of health Measurement Instruments (COSMIN) Checklist.

### Results:

Searches identified 689 articles, of which 34 met the inclusion criteria. These contained six scales that measured dystonia in children with CP: Burke-Fahn-Marsden Dystonia Rating Scale (BFMDRS); Barry Albright Dystonia Scale (BADs); Unified Dystonia Rating Scale (UDRS); Movement Disorder Childhood Rating Scale (MD-CRS); Movement Disorder Childhood Rating Scale 0–3 years (MD-CRS 0-3) and Dyskinesia Impairment Scale (DIS). Each scale provides useful information about dyskinesia with the majority focusing on dystonia. The BADs, which was designed for CP, is the most commonly reported scale and least complex to use clinically. The DIS is the only tool to consider both dystonia and choreoathetosis in CP. All tools classify impairment at the body functions and structures level. Some tools evaluate the impact of impairment on activity/participation.

### Key Practice Points:

- Six scales measure dystonia in children with dyskinetic CP
- One scale measures choreoathetosis in children with dyskinetic CP
- BADs has high utility and was the most commonly reported dystonia measure
- DIS measures dystonia and choreoathetosis and takes longer to administer.

## SELF-RATING OF WALKING SPEED IN PEOPLE WITH PARKINSON'S DISEASE FOR INDEPENDENT FALLS RISK ASSESSMENT

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R5-7, Meeting Room C4.2, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

To determine if people with Parkinson's disease have the potential to use the three-step clinical prediction tool for falls independently by accurately estimating their gait speed relative to 1.1m/s, as an alternative to clinical measurement of gait speed.

### Design:

An observational cohort study.

### Method:

Thirty community dwelling adults with Parkinson's disease (mean age 68.8 years; 63.3% male) participated. Two measures of gait speed estimation were taken: (i) participants answered a question about their gait speed relative to people their age without Parkinson's disease; and (ii) participants watched a reference video of people walking at 1.1 m/s and estimated their own speed on a visual analogue scale. Participant's actual

gait speed was then measured over 4m (as per the clinical prediction tool instructions) and compared with the two estimates.

**Results:**

Relative to the 1.1 m/s threshold, 24 (80%) correctly estimated their gait speed in answer to the walking question, and 23 (77%) correctly estimated after viewing the reference video.

**Conclusion/Key Practice Points:**

- Majority of people included in the study were able to correctly estimate their walking speed relative to a reference speed of 1.1 m/s. with either estimation method.
- Answers to the question appeared to be as accurate as video-based estimation.
- There is potential for the use of the three-step falls prediction tool as a self-assessment measure for people with Parkinson's disease (since the other two predictors (history or falls in previous year and history of freezing of gait in previous month) are self-reported).

**HOW ACCURATE IS SELF-PERCEIVED FORCE FOR REGULATING EXERCISE LOAD FOR THE NECK?**

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R5-7, Meeting Room C4.2, October 20, 2017, 3:50 PM - 4:35 PM

**Aim:**

To aim of this study was to investigate the accuracy of self-perceived force over a range of sub-maximal exercise loads of the cervical flexor and extensor muscles, before and after the experience of a maximal effort.

**Design:**

Cross-sectional.

**Method:**

Participants performed submaximal isometric cervical flexion and extension exercise at perceived intensities (25%, 50%, and 75% of their maximal with no feedback) in a neck dynamometer. Measurements of 'actual' versus 'perceived' levels of force were compared before and after the performance of a maximal. Data were analysed descriptively and the relationship between performance error, test, and participant factors examined.

**Results:**

With the exception of the 25% maximal extension trials post-maximal, an underestimation of force was observed over all conditions that worsened as the target force increased (50%, and 75%) with only some improvement following the experience of a maximal ( $p < 0.001$ ). Linear mixed modelling indicated participants familiar with exercise may have better accuracy ( $p = 0.07$ ).

**Conclusions/Key Practice Points:**

- Regulating isometric exercise load of the neck based on a perceived force is accurate at low intensities.
- Targeted exercise load may be underdone when using perceived force to perform exercise of the neck at moderate to high intensities.
- Accuracy of perceived force to regulate exercise may be improved by the experience of performing a maximal.

## ALTERED INTEGRATION OF PROPRIOCEPTIVE INFORMATION FOR BALANCE CONTROL IS ASSOCIATED WITH PROSPECTIVE FALLS

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R5-7, Meeting Room C4.2, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

This study aimed to investigate differences in balance control between young and older individuals who do and do not fall (measured prospectively in the 12 months after the balance measures).

### Design:

Prospective longitudinal study

### Methods:

Twenty-one young (21(2) years), and 106 elderly (78(16) years) individuals participated. Elderly were followed for one year to assess falls incidence. Forty-four reported one/more falls (fallers), and 62 reported no falls (non-fallers). At study inception, participants stood barefoot, blindfolded on a force plate (135s). Vibrators (60Hz) attached to triceps surae were activated twice for 15s. Center of pressure excursion was assessed for 15s at baseline, during and after vibration. Linear and non-linear analyses were used. Recurrence Quantification Analysis assessed the deterministic and laminar structure of centre of pressure. Detrended fluctuation analysis assessed temporal correlations. Group differences were assessed using wavelet-based one-way ANOVA.

### Results:

Centre of pressure displacement due to ankle vibration was not different between groups. At baseline, centre of pressure of the young was more deterministic and laminar, with stronger temporal correlation. Fallers and non-fallers did not differ at baseline. After the second ankle vibration; fallers exhibited lower determinism and lower laminar structure than non-fallers with weaker temporal correlations. These features were higher in the young. These results can be interpreted as more disorderly balance control in elderly, particularly fallers.

### Conclusion/Key Practice Points:

- Similarities at baseline suggest peripheral proprioception was not different between groups.
- Post-vibration differences suggest compromised reweighting of proprioceptive information in elderly.
- Differences between young and old were greater for fallers than non-fallers.

## LUMBAR EXTENSOR MUSCLE FORCE CONTROL IS ASSOCIATED WITH DISABILITY IN PEOPLE WITH CHRONIC LOW BACK PAIN

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R5-7, Meeting Room C4.2, October 20, 2017, 3:50 PM - 4:35 PM

### Aims:

To compare lumbar extensor force control in people with and without chronic low back pain; to investigate the relationship between disability and lumbar extensor force control in people with chronic low back pain.

### Design:

Cross-sectional study.

### Method:

Thirty-three chronic low back pain and 20 healthy people performed a lumbar extension force-matching task where they increased and decreased their force output to match a variable target force within 20%-50% maximal voluntary isometric contraction. Force control was calculated as the root-mean-square-error between participants' force output and target force across the increasing and decreasing portions of the force curve. Within- and between-group differences in force-matching error and the relationship between back pain

group's force-matching results and their Oswestry Disability Index scores were assessed using ANCOVA and linear regression, respectively.

#### Results:

Back pain group demonstrated more overall force-matching error (difference = 30% (95% CI 0.78 to 2.43),  $p = 0.022$ ) and more force-matching error while increasing force (difference = 45% (95% CI 1.01 to 3.37),  $p = 0.001$ ) than control group. Back pain group demonstrated more force-matching error while increasing than decreasing force (difference = 21% (95% CI 0.87 to 2.61),  $p = 0.015$ ). One unit increase in force-matching error while decreasing force output was associated with a 47% increase in disability ( $R^2 = 0.19$ ,  $p = 0.006$ ).

#### Conclusion:

Lumbar extensor force control is dramatically compromised in people with chronic low back pain. Force-matching error predicts a significant portion of disability, confirming the validity of this assessment for chronic low back pain patients.

### A RANDOMISED CONTROLLED TRIAL OF HOME-BASED EXERGAME STEP TRAINING IN PEOPLE WITH PARKINSON'S DISEASE

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R5-7, Meeting Room C4.2, October 20, 2017, 3:50 PM - 4:35 PM

#### Aim:

To determine whether home-based step training using videogame technology improves lower extremity motor function in people with Parkinson's disease.

#### Design:

Randomised controlled trial of a step-training exergame (physical exercise based videogame), with concealed allocation, blinded outcome assessment and intention-to-treat analysis.

#### Method:

Community-dwelling people with Parkinson's disease without significant cognitive impairment were randomly allocated into either the step training group ( $n = 31$ ) or control group ( $n = 29$ ). The step training group performed a modified dance-based stepping game at home using a computer unit and television, for a minimum of fifteen minutes, three times per week for 12 weeks. Both groups continued their usual care and physical activities. Primary outcome measures were choice stepping reaction time and the functional gait assessment. Secondary outcomes were physical and neuropsychological measures associated with falls in Parkinson's disease. Between-group differences were analysed using linear regression and a post-hoc analysis was undertaken to identify interaction effects between group and disease severity.

#### Results:

There were no statistically significant between group differences in any measures. However, there was a significant interaction ( $p = 0.02$ ) between group and disease severity for choice stepping reaction time with seemingly positive effects for the low severity group and potentially negative effects for the high severity group.

#### Conclusion/Key Practice Points:

- Home-based exergame step training did not improve participants' lower extremity motor function.
- When designing home-based exergame programs, tailoring the program according to disease severity may be important for people with Parkinson's disease.

Trial registration: ACTRN12613000688785

## A NOVEL METHOD TO RECORD CENTRE OF GRAVITY LOCATION CHANGES IN FREQUENTLY-USED BALANCE TESTS: RELEVANCE IN OLDER ADULTS

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R5-7, Meeting Room C4.2, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

This study assessed the ability of a novel method of recording centre of gravity location to detect change in centre of gravity location for a range of test conditions and ages in healthy adults.

### Design:

Cross-sectional cohort design allowed sampling from a broad spectrum of healthy adults.

### Method:

Eighty-one adults (51 women) aged 30-80 years participated. Exclusion criteria were conditions known to affect balance. Data from feet apart, feet together and single limb stance balance tests (three, ten-second trials each test) was collected on a Kistler force platform in one test session. Centre of gravity location was categorised as anterior or posterior to each participant's predicted centre of balance if two or more of the three trials were in the same sector.

### Results:

Analysis with Pearson's chi square demonstrated significant differences between feet apart and feet together positions for both eyes open ( $p = 0.001$ ) and closed ( $p = 0.01$ ) test conditions. As test difficulty increased, more participants positioned centre of gravity anteriorly. Age was a factor only in left single limb stance ( $p = 0.03$ ).

### Conclusion / Practice guidelines:

- This proposed method allows clinicians to objectively record centre of gravity location for tests on force or pressure plates.
- Centre of gravity location shifts anteriorly as test difficulty increases.
- There are differences for older adults for some tests.
- These differences need to be considered when training balance in older adults.
- Limitations – the method may be more useful in group rather than individual analyses.

## RISK FACTORS FOR GROIN INJURIES IN FOOTBALL

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<sup>1</sup>La Trobe University, Melbourne, Australia

SPA7A, Darling Harbour Theatre, October 20, 2017, 3:50 PM - 4:35 PM

### Background/aim:

Musculoskeletal hip/groin screening tests are commonly performed to detect at-risk individuals. Bony hip morphology is considered a potential intrinsic risk factor, but has not been examined prospectively. We aimed to evaluate the association between intrinsic risk factors and hip/groin injuries leading to time loss.

### Study Design:

Prospective cohort study

### Methods

Male professional soccer players underwent screening specific for hip/groin pain during two consecutive seasons of the Qatar Stars League. The screening battery included: pain provocation, range of motion, and strength tests, and hip X-ray examination. Time-loss hip/groin injuries and individual player exposure (training and match play) were recorded prospectively, and injuries categorised according to the Doha agreement. We calculated hazard ratios (HR) from univariate and multivariate Cox regression models to assess the relationship between potential risk factors and injury.

#### Results:

There were 411 players, completing 609 player seasons, and 113 hip/groin injuries that met the criteria for inclusion, with 85 of these injuries categorised as adductor-related. Previous hip/groin injury (HR= 1.8; 95% CI 1.2-2.7) and eccentric adduction strength were associated with hip/groin injury risk. Higher than normal eccentric adduction strength was associated with increased risk for all hip/groin injuries (HR=1.6; 95%CI 1.0-2.5), while lower than normal eccentric adduction strength was associated with increased risk for adductor-related injuries (HR =1.7; 95%CI 1.0-3.0).

#### Conclusion:

Significant associations were found between previous groin injury, eccentric adduction strength and groin injury risk. However, these associations were not strong enough to identify an 'at-risk' individual and therefore, not useful as screening tests to predict injury. Bony hip morphology (cam, pincer or dysplasia) was not associated with groin injury risk.

### THE DOHA CONSENSUS AGREEMENT FOR GROIN PAIN IN SPORTS: USING ASSESSMENT PRINCIPLES IN CLINICAL PRACTICE

#### **Delahunt E<sup>1</sup>**

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SPA7A, Darling Harbour Theatre, October 20, 2017, 3:50 PM - 4:35 PM

Groin pain is a common musculoskeletal complaint amongst field sport athletes. It is prevalent in soccer, Australian Rules football, Gaelic football and rugby union.

The wide variety of possible injuries in numerous anatomical structures and high prevalence of "abnormal findings" in asymptomatic athletes contribute to the complexity. Heterogeneous taxonomy of groin injuries in athletes adds further to the confusion. Clinical practice is challenging with clinicians using differing terminology to describe groin pain experienced by athletes. This is confounded by the fact that depending on cultural and geographical factors, even the same term can have multiple interpretations. A recent systematic review on the treatment of groin pain in athletes included 72 studies, in which 33 different diagnostic terms were used (Serner et al, 2015). The need for clear terminology and definitions has been highlighted numerous times (Serner et al, 2015; Branci et al, 2013).

The "Doha agreement meeting on terminology and definitions in groin pain in athletes" was convened to attempt to resolve this problem. The First World Conference on Groin Pain in Athletes was held in Doha, Qatar, in November 2014.

In the lead-up to this conference, 24 experts from a variety of backgrounds were invited to participate in the conference and agreement meeting. Dr Delahunt was a member of this expert panel. The "Doha agreement meeting on terminology and definitions in groin pain in athletes" reached a consensus on a clinically based taxonomy using three major categories. These definitions and terminology are based on injury history and physical examination findings, thus making them simple and suitable for use in both clinical practice and research.

### LIGAMENTUM TERES TEAR OF THE HIP IN BALLET AND SPORT

#### **Mayes S<sup>1</sup>**

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SPA7A, Darling Harbour Theatre, October 20, 2017, 3:50 PM - 4:35 PM

Ligamentum teres (LT) tear is a potential source of hip pain. Repetitive microtrauma in extreme ranges of motion and external rotation is believed to lead to LT injury. The LT may play a role in hip joint stability; and injury could lead to subsequent cartilage and labral damage or osteoarthritis. If conservative measures of rehabilitation fail, surgical intervention has been suggested. Research investigating LT is sparse. A study comparing MRI findings and clinical measures in professional ballet dancers with age and sex-matched athletes has revealed novel findings that can guide clinicians' diagnosis and management of hip pain. This presentation will outline the potential mechanism of injury, imaging findings and their relationship to clinical presentation. The relationship between LT tear and other associated hip joint pathologies will be explored.

## MRI-DEFINED PATELLOFEMORAL OSTEOARTHRITIS IS MORE PREVALENT IN YOUNG TO MIDDLE-AGED ADULTS WITH PATELLOFEMORAL PAIN THAN PAIN-FREE CONTROLS

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SPA7B, Meeting Room C3.3, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

Determine whether MRI features of patellofemoral osteoarthritis (PFOA) are more prevalent in people with patellofemoral pain (PFP) aged 26-50 years, compared to pain-free controls; and explore whether MRI features of PFOA in PFP are associated with symptoms and function.

### Design:

Case-control

### Method:

70 participants with PFP ( $\geq 3$  month's duration; 44 women; mean  $\pm$  SD age  $36 \pm 7$  years; BMI  $25.1 \pm 3.7$  kg/m<sup>2</sup>) and 26 pain-free controls (15 women; age  $34 \pm 7$  years; BMI  $24.6 \pm 4$  kg/m<sup>2</sup>) underwent 3.0T MRI of their nominated study knee. MRIs were scored using MOAKS, and compartmental prevalence of MRI OA features defined based on the presence of chondral lesions and bone-marrow lesions (BML). PFP participants also completed patient-reported outcomes.

### Results:

The PFP group had a significantly higher prevalence of MRI OA features, when defined as any BML ( $p = 0.017$ ), any chondral lesion + any BML ( $p = 0.013$ ), and full-thickness chondral lesion + any BML ( $p = 0.032$ ). When MRI PFOA was defined as full-thickness chondral lesion (with or without BML), those with PFOA features had significantly worse pain severity during sit-to-stand and running (pain visual analogue scale), and worse symptoms and daily function (Knee injury and Osteoarthritis Outcome Score). Those with PFOA defined as any BML reported significantly worse pain with running.

### Conclusion/Key Practice Points:

- Young to middle-aged adults with PFP have a higher prevalence of MRI OA features compared to age- and sex-matched controls.
- Full-thickness chondral lesions are associated with pain, symptoms and function, suggesting that MRI features of PFOA may not be benign in this population.

## QUALITY OF LIFE IS REDUCED IN INDIVIDUALS WITH PATELLOFEMORAL PAIN

**Coburn S<sup>1</sup>**, Barton C<sup>1</sup>, Filbay S<sup>3</sup>, Rathleff M<sup>2</sup>, Crossley K<sup>1</sup>

<sup>1</sup>La Trobe University, Bundoora, Australia, <sup>2</sup>Aalborg University, Aalborg, Denmark, <sup>3</sup>University of Oxford, Oxford, UK

SPA7B, Meeting Room C3.3, October 20, 2017, 3:50 PM - 4:35 PM

### Aim:

Compare quality of life (QOL) outcomes in individuals with patellofemoral pain (PFP), with population norms and pain-free controls; and determine whether intervention or other factors including Knee Osteoarthritis Outcome Score (KOOS) scales) have an impact on QOL.

### Design:

Systematic review.

### Method:

A systematic review (five databases) identified and quality appraised studies reporting QOL in individuals with PFP aged under 50 years. Random effects meta-analysis pooled QOL outcomes, allowing comparison to population norms and pain-free control groups. Random effects meta-analysis also determined QOL

treatment outcomes. Relationships of QOL with age, BMI and other KOOS-domains were evaluated through meta-regression analysis.

**Results:**

22 eligible studies (1174 individuals with PFP) were identified. Pooled KOOS-QOL mean was 55 (95%CI 47 to 63) in individuals with PFP – much lower than population norms (84, 95%CI 81 to 88) and pain-free control groups (97, 95%CI 94 to 100). Intervention improved QOL in repeated measures studies, but results were mixed in studies comparing treatment to a control group. KOOS-QOL outcomes were positively related to KOOS-Activities of daily living ( $R^2=0.93$ ) and KOOS-Sport/recreation participation ( $R^2=0.99$ ). Some short-form 36 domain scores were negatively related to body mass index and age.

**Conclusion/Key Practice Points:**

- QOL is impaired in individuals with PFP compared to general populations and pain-free controls.
- Intervention of any type may positively influence QOL, but there are too few controlled studies to be certain.
- Reduced ability to perform activities of daily living and sports participation; and higher BMI and age are related to poorer QOL.

**PATELLOFEMORAL CARTILAGE DAMAGE WORSENS MORE THAN TIBIOFEMORAL BETWEEN ONE AND FIVE YEARS FOLLOWING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION**

**Patterson B<sup>1</sup>**, Crossley K<sup>1</sup>, Culvenor A<sup>1,2</sup>, Barton C<sup>1</sup>

<sup>1</sup>La Trobe University, Bundoora, Australia, <sup>2</sup>Paracelsus Medical University, Institute of Anatomy Salzburg & Nuremberg, Salzburg, Austria

SPA7B, Meeting Room C3.3, October 20, 2017, 3:50 PM - 4:35 PM

**Aim:**

Describe worsening cartilage damage on magnetic resonance imaging (MRI) in the patellofemoral and tibiofemoral joints from one to five years following anterior cruciate ligament reconstruction (ACLR), and explore participant characteristics associated with these changes.

**Design:**

Longitudinal study

**Methods:**

The ACLR knee of 78 participants (48-men, 30-women; 32±15 years) were assessed for cartilage defects (partial- and full-thickness) using the MRI Osteoarthritis Knee Score at one and five years post-ACLR. Worsening cartilage damage was defined as a new cartilage defect, or an increase in defect severity. Logistic regression evaluated factors (age, sex, BMI, surgery delay, concomitant injuries) associated with worsening.

**Results:**

Patellofemoral and tibiofemoral cartilage lesions were observed in 47 (60%) and 45 (58%) participants, respectively at five years. Worsening of defects (one-five years) in the patellofemoral and tibiofemoral compartments occurred in 44% and 18% of participants, respectively. Of all joint surfaces, cartilage defects in the medial trochlea demonstrated the greatest worsening. Older age (OR 1.1 [95% CI 1.0 to 1.2]) and concomitant cartilage/meniscal defects assessed arthroscopically at the time of surgery (OR 3.7 [95% CI 1.1 to 11.3]) increased the odds of worsening patellofemoral (but not tibiofemoral) cartilage defects.

**Key Practice Points:**

- The patellofemoral joint may be at particular risk for early posttraumatic osteoarthritis, especially in older individuals with concomitant meniscal tears. This is clinically important as patellofemoral osteoarthritis typically precedes tibiofemoral osteoarthritis.
- Early identification of young adults at risk of cartilage deterioration may provide avenues (e.g. targeted patellofemoral interventions) to address associated symptomatic/functional decline.

## CANINE STENOSING TENOSYNOVITIS OF ABDUCTOR POLLICIS LONGUS - DE QUERVAIN'S FOR DOGS

**Robartes H<sup>1</sup>**

<sup>1</sup>*Vetphysio Ltd, New Zealand*

APG8, Meeting Room C3.4, October 20, 2017, 4:40 PM - 5:25 PM

### Aim:

To inform veterinary/animal physiotherapists about this rare, or possibly under-diagnosed, condition, so that they can recognise its presentation and manage it appropriately.

### Design:

A summary of the clinical presentation, diagnostic (radiological, ultrasonographic, and histopathological) signs, and current best clinical management, as well as suggestions of the potential role(s) of veterinary/animal physiotherapists as part of the multidisciplinary veterinary team.

### Method:

Relevant studies were found via searches of online databases, and the information was consolidated.

### Results:

A total of 7 papers relating to the subject of canine stenosing tenosynovitis of abductor pollicis longus were found.

### Conclusion:

Canine stenosing tenosynovitis of abductor pollicis longus has a distinctive clinical presentation and diagnostic signs, many of which are comparable to de Quervain's. Presently, this condition is best managed directly by veterinarians, with corticosteroid injections into the tendon sheath (acute cases), or surgical release and debridement of the tendon (chronic cases). Veterinary/Animal physiotherapists may have a role in identifying this condition and making appropriate veterinary referrals, and in management of secondary complications that may result. Furthermore, as there is still no obvious reason for the development of this condition, veterinary/animal physiotherapists may add to the current knowledge base by noting what these canine patients concurrently present with (such as conformational faults or other orthopaedic pathologies), that may predispose them to developing stenosing tenosynovitis of abductor pollicis longus. This will lead to a better understanding of the risk factors for this condition, and hopefully its prevention.

## MUSCULOSKELETAL ASSESSMENT OF THE EQUESTRIAN ATHLETE - THE RIDER.

**Goff L<sup>1</sup>**

<sup>1</sup>*Hip Sport Spine Physiotherapy, Toowoomba, Australia*, <sup>2</sup>*Active Animal Physiotherapy, Toowoomba, Australia*, <sup>3</sup>*University of Queensland, Gatton, Australia*

APG8, Meeting Room C3.4, October 20, 2017, 4:40 PM - 5:25 PM

### Background:

Physiotherapists are uniquely placed to manage the equestrian athlete, as they can assess and treat the rider as well as the horse. This how-to session provides the perspective of an experienced titled musculoskeletal and animal physiotherapist in assessment of the rider. Participants are expected to have some knowledge of rider requirements and some manual therapy background.

### Aims/objectives:

The aim is to demonstrate musculoskeletal assessment of the unmounted rider, with emphasis on the rider lumbo-pelvic-hip region. Objectives include having participants observe the unmounted rider statically and dynamically, palpating the lumbo-pelvic-hip region and deriving clinical information from the manual testing. Learning outcomes include an enhanced awareness of importance of the pelvis and hip region as primary contact point of rider with horse and how this can affect performance; gleaning a manual therapy approach to assessing this region in the rider.

### Approach:

The presenter will utilise live model/s to demonstrate the assessment of the rider's posture and biomechanics. The demonstration will include observing the posture and palpating the contact points of the

rider with the horse and then discussing the findings with a view to optimal musculoskeletal management of the rider. There will be active participation in the session.

**Key Practice Points:**

- The participants will glean an understanding of the importance of the lumbo-pelvic-hip region in contributing to performance of the rider, and take away manual assessment techniques to enable them to assess and manage the equestrian athlete.

## EFFECT OF GROUND-BASED WALKING TRAINING ON DAILY PHYSICAL ACTIVITY LEVELS IN PEOPLE WITH COPD

**Wootton S**<sup>1,2</sup>, Hill K<sup>3,4</sup>, Alison J<sup>2,5</sup>, Ng C<sup>3,6</sup>, Jenkins S<sup>3,4,8</sup>, Eastwood P<sup>3,7,10</sup>, Hillman D<sup>7</sup>, Jenkins C<sup>9</sup>, Spencer L<sup>5</sup>, Cecins N<sup>4,8</sup>, Straker L<sup>3</sup>, Mckeough Z<sup>2</sup>

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CRP8, Meeting Room C4.4, October 20, 2017, 4:40 PM - 5:25 PM

**Aim:**

To determine the effects of walking training on daily physical activity levels in COPD.

**Design:**

A multi-site randomised controlled trial.

**Method:**

Participants with COPD were randomised to a walking group who received supervised, ground-based walking training, two to three times a week for eight to 10 weeks or a control group that received usual medical care. Before and after the intervention period, physical activity was collected over seven days using the SenseWear® Pro3 Armband. Physical activity was expressed as; (i) energy expenditure (kcal), (ii) time spent in physical activity at light (1.5 and < 3.0 metabolic equivalents [METs]), moderate (3.0 and < 6.0 METs) and vigorous intensities (≥ 6.0 METs) and, (iii) daily step count.

**Results:**

Of the 143 participants, 101 had sufficient data for the primary analysis; 62 were from the walking group (mean [SD] age 69 [8] years, FEV<sub>1</sub>42 [15] % predicted) and 39 were from the control group (age 68 [9] years, FEV<sub>1</sub>43 [15] % predicted). No between-group differences were demonstrated in any measure of physical activity (all p < 0.05). Secondary analyses (n=44) revealed that, compared to the control group, those in the walking group increased the proportion of waking hours spent in moderate intensity physical activity accumulated in uninterrupted bouts of between 30 to 60 minutes by 0.8% (95% CI 0.4 to 1.3).

**Conclusion/Key Practice Points:**

- Ground-based walking training alone was not effective at improving overall daily physical activity levels compared to usual medical care in people with COPD.

## PULMONARY REHABILITATION WITH AND WITHOUT COGNITIVE BEHAVIORAL THERAPY FOR BREATHLESSNESS IN PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE.

**Williams M<sup>1</sup>**, John D<sup>1</sup>, Baldock K<sup>1</sup>, Cafarella P<sup>2,3</sup>, Frith P<sup>1,2,3</sup>

<sup>1</sup>University of South Australia, Adelaide, Australia, <sup>2</sup>Southern Adelaide Local Health Network, Adelaide, Australia, <sup>3</sup>Flinders University of South Australia, Adelaide, Australia

CRP8, Meeting Room C4.4, October 20, 2017, 4:40 PM - 5:25 PM

### Aim:

To determine whether comprehensive pulmonary rehabilitation (CPR) including cognitive behavioural therapy for breathlessness (BREVE) improves health outcomes compared to CPR alone.

### Design:

Pragmatic randomised controlled trial

### Method:

People with COPD and at least moderate airflow obstruction (FEV1 < 80 % pred, FEV1/FVC <70%) participated in eight-week, block randomized CPR+BREVE or CPR alone. Primary outcomes (six minute walk distance (6MWD) and Hospital Anxiety and Depression scale (HADs-A, HADs-D)) were assessed at baseline and one month after intervention. Differences between groups were assessed with random effects mixed models (intention to treat).

### Results:

101 participants (mean age 70 ± SD 8.5, 54 males, FEV1 % pred 47.7 ± 16.3) enrolled in the trial. Between groups, primary outcome measures did not differ significantly at baseline or one month post intervention. Improvements favored CPR+BREVE over CPR alone (6MWD mean 21.2 m (SD 49.4), 95% CI 1.0 to 41.4 vs -4.8 m (58.6), 95% CI -28.8 to 19.2; HADs-A -0.7 (2.7) 95% CI -1.7 to 0.3 vs 0.8 (3.2), 95% CI -0.4 to 2.0; HADs-D -0.5 (2.6) 95% CI -1.5 to 0.5 vs 0.2 (2.9), 95% CI -0.8 to 1.2). Improvement in HADs-A for CPR+BREVE was within the range for important clinical differences (-1.8 to -1.3).

### Conclusion/ Key Practice Points:

- Improvements in primary outcomes for both groups were less than those reported in systematic reviews of pulmonary rehabilitation likely reflecting pragmatic inclusion criteria
- CPR with CBT has potential benefit for improving health outcomes beyond those achieved with CPR in clinical settings.

## THE STERNAL MANAGEMENT ACCELERATED RECOVERY TRIAL (SMART): A RANDOMIZED CONTROLLED TRIAL INVESTIGATING STERNAL MANAGEMENT FOLLOWING CARDIAC SURGERY

**Md Ali K<sup>1</sup>**, Denehy L<sup>1</sup>, Granger C<sup>1</sup>, Royse A<sup>2</sup>, Royse C<sup>2</sup>, Bates R<sup>3</sup>, Logie S<sup>4</sup>, Clarke S<sup>5</sup>, El-Ansary D<sup>1</sup>

<sup>1</sup>Department of Physiotherapy, The University of Melbourne, Carlton/Parkville, Australia, <sup>2</sup>Department of Surgery, The University of Melbourne, Carlton/Parkville, Australia, <sup>3</sup>Physiotherapy Department, Royal Melbourne Hospital, Carlton/Parkville, Australia, <sup>4</sup>Physiotherapy Department, Melbourne Private Hospital, Carlton/Parkville, Australia, <sup>5</sup>Statistical Consulting Centre, The University of Melbourne, Carlton/Parkville, Australia

CRP8, Meeting Room C4.4, October 20, 2017, 4:40 PM - 5:25 PM

### Aim:

To determine the effect of modified (less-restrictive) sternal precautions compared to usual care (restrictive) sternal precautions for patients following cardiac surgery on physical function.

### Design:

Multi-site phase II randomized controlled trial with concealed allocation, patient and assessor blinding, and intention to treat analysis.

#### Method:

72 adults (92.3% male, aged 63±11 years) who had cardiac surgery via a median sternotomy were included. The intervention group (less-restrictive precautions) was advised to use pain and discomfort as the safe limits for their upper limb use during daily activities. The usual care group received advice to restrict their upper limb use for four to six weeks as per usual care. Both groups received individualized education in hospital and via the telephone weekly for six weeks post-operatively. The primary outcome was physical function assessed by the Short Physical Performance Battery. Secondary outcomes included upper limb function, pain, kinesophobia, and health-related quality of life. Measures were performed pre-hospital discharge; and four weeks and three months post-operatively. Adherence to sternal precautions was recorded.

#### Results:

There were no significant differences in physical function between the two groups at four weeks or three months post-operatively (mean difference 1.0, 95%CI -0.2 to 2.3; mean difference 0.4, 95%CI -0.9 to 1.6 respectively). There were no differences in secondary outcomes.

#### Conclusion/Key Practice Points:

- A program of modified (less-restrictive) sternal precautions for patients following cardiac surgery did not improve physical recovery, pain or enhance HRQoL compared to usual care.

Trial registration number: Australian and New Zealand Clinical Trials Registry (ANZCTR12615000968572).

#### WHO IS RESPONSIBLE FOR ENHANCING THE READINESS OF NEW GRADUATE PHYSIOTHERAPISTS FOR PRIVATE PRACTICE?

Wells C<sup>1</sup>, Bialocerkowski A<sup>1</sup>, **Carroll S<sup>2</sup>**, Chipchase L<sup>3</sup>, Kent F<sup>4</sup>, Olson R<sup>5</sup>, Reubenson A<sup>2</sup>, Scarvell J<sup>6</sup>

<sup>1</sup>Griffith University, Southport, Australia, <sup>2</sup>Curtin University, Bentley, Australia, <sup>3</sup>Western Sydney University, Campbelltown, Australia, <sup>4</sup>Monash University, Frankston, Australia, <sup>5</sup>University of Queensland, St Lucia, Australia, <sup>6</sup>University of Canberra, Bruce, Australia

EDU8A, Meeting Room C4.11, October 20, 2017, 4:40 PM - 5:25 PM

#### Aim:

What are the perceived roles of academics, employers, and graduates in enhancing the readiness of new graduate physiotherapists for private practice?

#### Design:

A qualitative study was conducted between April and November 2016.

#### Method:

Academics, employers, and recent graduates from around Australia participated in 3 electronic surveys and 12 focus groups. Thematic analysis of data was undertaken by two researchers using Nvivo.

#### Results:

112 participants completed surveys, and 52 participated in focus groups. The perceived role of academics is to ensure new graduates are clinically competent, and orientate students to private practice, which may include organising private practice placements, and teaching business and transferable knowledge and skills. The perceived role of employers is to provide clinical placements for students, and new graduate employment opportunities where new graduates are provided with a salary, longer appointment times, access to senior staff and peer support, mentoring and continuing education. The perceived role of students is to seek extra-curricular private practice or client service experience, and graduates to reflect on their learning needs, negotiate supportive employment, and seek opportunities for continuing education and professional development.

#### Conclusion/Key Practice Points:

- Stakeholders agreed that academics, employers, and graduates have a role in enhancing the readiness of new graduates for private practice.
- Study findings are not statistically generalisable but provide rich insight into participants' experiences.

- Further research is required to evaluate the relative effectiveness of different strategies for orientating students to private practice at university, and providing support, mentorship, and education for new graduates.

## THE RELATIONSHIP BETWEEN PRE-CLINICAL SUMMATIVE ASSESSMENT SCORES AND STUDENT PERFORMANCE IN CLINICAL PRACTICE

**Terry R<sup>1</sup>**, Hing W<sup>1</sup>, Orr R<sup>1</sup>, Milne N<sup>1</sup>

<sup>1</sup>*Bond University, Robina, Australia*

EDU8A, Meeting Room C4.11, October 20, 2017, 4:40 PM - 5:25 PM

### Aim:

To determine the relationship between students summative assessment scores in pre-clinical coursework and their performance in clinical practice.

### Design:

A retrospective cohort study of students from four consecutive intakes of a post-graduate entry-level physiotherapy program.

### Method:

Assessment data for pre-clinical and clinical practice subjects in four core clinical areas of physiotherapy were retrieved. Summative assessments investigated were Objective Structured Clinical Examinations, written examinations and oral presentations. Performance in clinical practice was assessed using the Assessment of Physiotherapy Practice instrument. Mean scores for each assessment type were calculated and entered into SPSS v 23 for analysis. Pearson's correlations and multiple regression were performed between mean pre-clinical summative assessment scores and clinical performance scores. Ethical approval was received from Bond University Human Research Ethics Committee.

### Results:

Assessment data from 121 students were analysed. Pre-clinical assessment scores were significantly related to clinical performance. The relationships determined between clinical performance and pre-clinical assessment scores were: Objective Structured Clinical Examinations  $r = 0.55$ ,  $p < 0.001$ ; written examinations  $r = 0.33$ ,  $p < 0.001$ ; and oral presentations  $r = 0.27$ ,  $p = 0.003$ . A multiple regression model containing the three pre-clinical assessments (adjusted  $R^2 = 0.32$ ) demonstrated that the Objective Structured Clinical Examinations ( $B = 0.89$ ,  $p < 0.001$ ) and oral presentations ( $B = 0.33$ ,  $p = 0.01$ ) were significant independent contributors.

### Conclusion:

Objective Structured Clinical Examination scores were strongly related with clinical performance. This poses the question: could they be used to highlight students at risk of poor performance in clinical practice?

## FLIPPED (FLIPPED LEARNING IN PARAMEDIC AND PHYSIOTHERAPY EDUCATION) CREATING AUTONOMOUS LEARNERS BY FLIPPING THE CLASSROOM ONE WEEK AT A TIME

**Lane R<sup>1</sup>**, Ross L<sup>1</sup>, Taylor C<sup>1</sup>

<sup>1</sup>*Monash University, Frankston, Australia*

EDU8A, Meeting Room C4.11, October 20, 2017, 4:40 PM - 5:25 PM

### Aim:

To evaluate the effectiveness of a traditional versus flipped classroom approach on teaching and learning in undergraduate physiotherapy and paramedic students.

### Design:

Mixed methodology design with qualitative survey and quantitative results based evaluation of traditional and flipped learning in a problem based learning curriculum.

#### Method:

Across select in-semester teaching weeks, didactic lectures for year two physiotherapy students (n=92) were replaced with online teaching resources and novel learning approaches during face-to-face tutorials and activities that promote student-centered active learning and facilitate deeper content engagement. Outcomes were measured via qualitative online survey evaluation and quantitative online quizzes.

#### Results:

Qualitative survey trends favour increased student satisfaction and perceived student engagement and experiential learning with respect to flipped content delivery. Preliminary data suggests improved quantitative student learning and depth of understanding supporting experiential learning theory and problem based collaborative learning models.

#### Conclusion/Key Practice Points:

- The flipped classroom as a teaching and learning approach positively engages students in independent learning, leading to greater ownership of learning and deeper understanding of the content explored.
- The flipped classroom offers an alternative approach to content delivery with competitive demands on space and human resources for didactic content delivery.
- Carefully constructed content and methodological planning is required to maximize efficacy of the flipped model.
- Further research examining the effect on student future learning is required to evaluate the impact of flipped learning in a problem based curriculum on the transition of health professional students to independent clinicians with the skills to enquire, learn, reflect and develop their practice.

#### **SIMULATION BASED EDUCATION (SBE) PERCEIVED MORE BENEFICIAL BY THOSE WITH LOW LEVELS OF CONFIDENCE TO PRACTICE AS A PHYSIOTHERAPIST**

**Blackstock F<sup>1</sup>**, Thapa T<sup>1</sup>, Watson K<sup>2</sup>, Morris N<sup>3</sup>, Jones A<sup>4</sup>, Wright T<sup>5</sup>, Rivett D<sup>6</sup>, McMeekan J<sup>7</sup>, O'Connor V<sup>8</sup>, Jull G<sup>2</sup>

<sup>1</sup>Western Sydney University, Penrith, Australia, <sup>2</sup>Division of Physiotherapy, School of Health and Rehabilitation Science, The University of Queensland, St Lucia, Australia, <sup>3</sup>School of Allied Health Sciences and Menzies Health Institute, Griffith University, Gold Coast, Australia, <sup>4</sup>College of Healthcare Sciences, James Cook University, Townsville, Australia, <sup>5</sup>School of Physiotherapy and Exercise Science, Curtin University of Technology, Perth, Australia, <sup>6</sup>School of Health Sciences, Discipline of Physiotherapy, The University of Newcastle, Callaghan, Australia, <sup>7</sup>Faculty of Medicine, Dentistry and Health Sciences, The University of Melbourne, Melbourne, Australia, <sup>8</sup>School of Medicine, The University of Queensland, Herston, Australia

EDU8B, Meeting Room C4.6, October 20, 2017, 4:40 PM - 5:25 PM

#### Aim:

To determine whether self-reported confidence to practice as a physiotherapist is a predictor of perceived usefulness of learning using SBE by entry-level students.

#### Design:

Four single-blind parallel multi-institutional randomised controlled trials examined the capacity for two different models of SBE to part replace learning in two areas of traditional clinical physiotherapy practice.

#### Method:

Three-hundred-and-sixty entry-level physiotherapy students completed the SBE module comprising one week of a four-week clinical placement experience.

#### Outcome measures:

Prior to SBE, students rated their confidence to practice physiotherapy. Students also rated the usefulness of SBE in clinical learning immediately following SBE, and at the end of clinical placement, using a 10-point scale. Associations were examined using a Spearman's Rho, and predictors of perceived usefulness of SBE determined with a regression analysis.

#### Results:

Confidence to assess a patient was a predictor of perceived usefulness of SBE both immediately following ( $t=3.550$ ,  $p<0.001$ ) and at the end of the clinical placement ( $t=4.017$ ,  $p<0.001$ ). An interspersed model of SBE was a predictor of perceived usefulness at the end of the clinical placement ( $t=2.326$ ,  $p=0.021$ ). Academic performance was not a predictor of perceived usefulness ( $t=0.370$ ,  $p=0.712$ ).

#### Conclusions/Key practice points:

- Entry-level physiotherapy students who report lower levels of confidence to practice physiotherapy perceive greater usefulness of SBE in clinical learning.
- Model of SBE curriculum predicted usefulness for learners suggesting further research on ideal model is needed.
- Considering high costs associated with SBE, targeting learners with lower confidence to participate in SBE prior to clinical placements should be examined.

### MOVING TOWARDS LGBTI-INCLUSIVE PRACTICE IN PHYSIOTHERAPY

**Keng A<sup>1</sup>**, Twyerould R<sup>1</sup>, Dunbabin A<sup>1</sup>, Remedios L<sup>1</sup>, Granger C<sup>1</sup>, Eibl-Geldart A<sup>1</sup>

<sup>1</sup>University of Melbourne, Parkville, Australia

EDU8B, Meeting Room C4.6, October 20, 2017, 4:40 PM - 5:25 PM

#### Aim:

To create an online educational resource for health students and professionals to improve their knowledge of the health needs of people who are lesbian, gay, bisexual, transgender or intersex (LGBTI); and to explore the preliminary effectiveness of the resource.

#### Design:

Baseline survey, development and implementation of the educational resource, and post survey.

#### Method:

The survey was completed by 113 physiotherapy students and 4 academic staff. Survey items assessed understanding of LGBTI-specific health needs, professional knowledge and self-efficacy in providing LGBTI-inclusive care, and attitudes towards incorporating LGBTI health in curricula. An educational resource “LGBTi know” was developed in consultation with LGBTI community members. This was implemented into the curriculum in 2016 at The University of Melbourne for physiotherapy students and disseminated to academic staff.

#### Results:

Post-implementation survey findings suggested “LGBTi know” was an engaging tool; and effective in improving knowledge and awareness regarding LGBTI health. 90% of participants viewed it as an important inclusion into health science curricula. 75% rated their awareness on LGBTI specific health needs as ‘good’ or ‘excellent’ compared to 15% pre-viewing.

#### Key Practice Points:

- There is a lack of curricula in physiotherapy education targeting healthcare needs of people who are LGBTI. Improving cultural competency within physiotherapy education is important.
- This project developed and piloted a new resource. Preliminary findings suggest it was well received by participants, but further research is required to examine the effectiveness of changing healthcare delivery.
- “LGBTi know” provides the foundation for a larger commitment to formal LGBTI training for health professionals.

## IS PHYSIOTHERAPY EFFECTIVE FOR OLDER PEOPLE LIVING WITH DEMENTIA?

**Taylor M**<sup>1,2,3</sup>

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GPA8, Meeting Room C3.6, October 20, 2017, 4:40 PM - 5:25 PM

### Outline of presentation:

Older people with dementia decline cognitively over time but are also at increased risk of physical and functional decline, and falls. At the present time, as there are no cures for dementia, physiotherapists are uniquely placed to assist older people with dementia to live well and maintain their independence. Physical activity and exercise have many potential benefits for older people living with dementia e.g. cognitive and physical/functional performance, fall prevention, depressive symptoms, behavioural and psychological symptoms of dementia and cardiovascular health. The current evidence for the effectiveness of physiotherapy for people living with dementia will be discussed.

### Key Practice Points:

- Gain knowledge/an understanding of why should physiotherapists be involved in the care of older people with dementia
- Gain knowledge/an understanding of what physiotherapists have to offer (evidence-based interventions) in the care of older people with dementia
- Gain an understanding of how to effectively work and engage with older people with dementia.

## RETRAINING SIT-TO-STAND STRATEGIES IN PEOPLE LIVING WITH DEMENTIA

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GPA8, Meeting Room C3.6, October 20, 2017, 4:40 PM - 5:25 PM

### Aim:

In people living with dementia, retraining sit-to-stand (STS) using strategies (sliding forward, feet backwards, leaning forward, pushing through the armrests) may be challenging due to declarative memory problems and difficulties following instructions. This study aimed to investigate the feasibility and utility of spaced retrieval, errorless learning and vanishing cues in retraining STS strategies.

### Design:

Single case experimental design with multiple baselines across subjects was employed involving four participants randomly allocated to baseline length.

### Method:

Four participants (two male) with Alzheimer's disease or mixed dementia (aged 75 to 94 years) underwent four to seven baseline assessments, followed by eight training sessions (one per day), four maintenance sessions (over two days) and a final assessment of generalisation. Assessments and training sessions were video recorded and randomised video clips were evaluated by a blinded assessor. Data were presented in graph format and analysed visually.

### Results:

Participants were able to use all four STS strategies in the correct sequence during training sessions. Two participants with more severe cognitive decline progressed through the training sessions slower, yet demonstrated stronger learning outcomes than other participants when tested without the instruction sheet. Participants responded to commands provided by a person not involved in the study and more frequently used all four strategies when the instruction sheet was provided.

Conclusion:

The findings support the feasibility and utility of using spaced retrieval, errorless learning and vanishing cues when supported by an instruction sheet and the command repeated verbatim in retraining STS in people living with dementia.

**CANCER SURVIVORS AWAITING REHABILITATION RARELY MEET RECOMMENDED PHYSICAL ACTIVITY LEVELS: AN OBSERVATIONAL STUDY**

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MPA8B, Meeting Room C4.8, October 20, 2017, 4:40 PM - 5:25 PM

Aim:

Describe physical activity levels and identify key factors associated with physical activity levels of cancer survivors entering oncology rehabilitation.

Design:

Prospective, observational study.

Method:

Fifty cancer survivors referred to an oncology rehabilitation program were eligible. Those with end stage disease or who were more than 12 months post treatment were excluded. Moderate intensity physical activity (cadence > 100 steps/minute) was measured with an accelerometer worn continuously for 24 hours over 6 days. Multiple linear regression was completed to identify predictors of physical activity. Predictor variables included clinical/demographic factors (age, cancer type, treatment, body mass index), physical factors (walking endurance, strength, fatigue), and psychological factors (depression, anxiety, self-efficacy, quality of life).

Results:

Four participants (8%) achieved recommended physical activity levels. Participants recorded a mean of 12 minutes (SD 12.3) of moderate intensity activity per day. Greater walking capacity ( $p \leq .001$ ) was the strongest independent predictor of physical activity. A 10 m increase in walk distance resulted in a 7% improvement in physical activity. Breast cancer diagnosis ( $p = .005$ ), greater anxiety ( $p = .007$ ) and lower body mass index ( $p = .014$ ) were also independent predictors of greater physical activity. The final model explained 70.5% of the variance in physical activity levels of people awaiting rehabilitation ( $p \leq .001$ ).

Conclusion/Key practice points:

- Cancer survivors awaiting rehabilitation have difficulty achieving recommended physical activity levels.
- Greater walking capacity was the strongest predictor of higher physical activity.
- Modifiable factors can be addressed during cancer rehabilitation to improve physical activity.

**CLINICAL IMPLICATIONS FROM A SERIES OF STUDIES DEVELOPING AND TESTING THE 'GO PROGRAM': A PHYSICAL ACTIVITY INTERVENTION FOR CLINICAL POPULATIONS**

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MPA8B, Meeting Room C4.8, October 20, 2017, 4:40 PM - 5:25 PM

Aim:

To develop and test a physical activity behaviour change intervention with integrated remote-communication suitable for clinical settings.

**Design:**

Multiple studies (quantitative questionnaires, qualitative questionnaires, cross-sectional studies and randomized controlled trial).

**Method:**

Patients and clinicians participated in a series of development studies (total n > 400) that culminated in a physical activity behaviour change program underpinned by Bandura's Social Cognitive Theory. The 'Go Program' is a physical activity promoting intervention delivered in addition to usual care. The program commences with an initial face-to-face interaction followed by remote-communication support (via telephone, email or print-and-post). Logbook notes and implementation process records from a four-group randomized trial (n = 104) were used to summarize additional practical insights for physiotherapists treating patients with musculoskeletal conditions and multiple co-morbidities.

**Results:**

Receiving communication via print-and-post materials was preferred by patients, but less preferred by physiotherapists who perceived it to be less likely to be effective than telephone conversations. Receiving support via email was perceived to be desirable and potentially effective by both patients and physiotherapists. Social media private messages were least preferred ( $p < 0.001$ ). Implementation records from the randomised trial indicated that behaviour change support strategies including personalized goal setting were most effectively delivered via telephone conversations. Communicating via print-and-post letters or email required less labour time but less likely to elicit responses from patients.

**Conclusion/Key Practice Points:**

- Interactive behaviour change supports can be delivered remotely via telephone for most patients.
- Patients may be less likely to respond to messages sent via post or email.

**THE ASSOCIATION BETWEEN LOW BACK PAIN AND PHYSICAL ACTIVITY IS MODERATED BY NEIGHBORHOOD WALKABILITY**

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MPA8B, Meeting Room C4.8, October 20, 2017, 4:40 PM - 5:25 PM

**Aim:**

To investigate whether the association between physical activity (PA) and low back pain (LBP) is moderated by neighborhood walkability.

**Design:**

A cross-sectional analysis using a co-twin design to control for genetics and shared environmental factors.

**Method:**

A cross-sectional analysis was performed on 10,228 twins from the Washington State Twin Registry with available data on LBP from recruitment surveys between 2009 and 2013 who reported LBP within the previous 3 months. Our outcome variables were sufficient moderate or vigorous-intensity (MV) PA and walking ( $\geq 150$  min per week). Neighborhood walkability was estimated using the commercially available Walk Score®.

**Results:**

Individuals reporting LBP were significantly less likely to engage in sufficient MVPA if they lived in a neighborhood with high walkability (OR = 0.59, 95%CI: 0.36–0.96). There was no association between LBP and sufficient MVPA for individuals living in a neighborhood with low walkability (OR = 1.27, 95%CI: 0.93–1.72), demonstrating that walkability is a significant moderator of the association between LBP and PA (interaction  $p = 0.013$ ). These findings were similar for the association between LBP and walking, although not significant ( $p = 0.700$ ).

#### Conclusion/Key Practice Points:

- Neighborhood walkability moderates the association between LBP and PA.
- Our results highlight the importance of targeting interventions promoting PA towards individuals with LBP living in a neighborhood with good walkable access to amenities.
- It is important for physiotherapists to be aware of the opportunities for physical activity in their local area to assist patients to become sufficiently active.

#### PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR SUBSEQUENT TO SERIOUS ORTHOPAEDIC INJURY

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MPA8B, Meeting Room C4.8, October 20, 2017, 4:40 PM - 5:25 PM

#### Aim:

Amongst orthopaedic patients, there is potential for an elevated risk of immobility-related chronic disease. Quantifying activity levels following serious orthopaedic injury is vital for determining potential drivers of poor health in this population. The aim of this study was to systematically review and synthesise the evidence on physical activity and sedentary behaviour following serious orthopaedic injury.

#### Design:

Systematic review and synthesis of objective evidence relating to physical activity and sedentary behaviour following orthopaedic injury.

#### Methods:

Studies on physical activity and sedentary behaviour measured objectively among patients with serious orthopaedic injury (acute bone or soft-tissue injury requiring emergency hospital admission and/or non-elective surgery) were identified through systematic searches of eight electronic databases.

#### Results:

Seven out of 2572 potentially eligible studies were identified for review: five on hip fractures and two on other orthopaedic injuries. Follow-up ranged from four days to two years post-injury. Physical activity levels were found to be low at all time points post-injury, with hip fracture patients achieving only 1% of recommended physical activity levels seven months post-injury. Patients were highly sedentary throughout all stages of recovery, spending 76% to 99% of the day sitting or reclining.

#### Conclusions/Key Practice Points:

- Low physical activity levels and high levels of sedentary behaviours were found consistently throughout recovery.
- More research is needed to identify the impact of physical inactivity and sedentary behaviour on long-term orthopaedic injury outcomes and the risk of chronic disease, and to identify the potential for increasing physical activity and reducing sedentary behaviour subsequent to orthopaedic injury.

#### A SYSTEMATIC REVIEW AND META-ANALYSIS OF THE CLINICAL BENEFITS OF PASSIVE JOINT MOBILISATION ON ANKLE SPRAINS

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MPA8C, Meeting Room C4.5, October 20, 2017, 4:40 PM - 5:25 PM

#### Aim:

To assess the clinical benefits of passive joint mobilisation on ankle sprains

Design:  
A systematic review and meta-analysis

Methods:

This review evaluated the clinical benefits of passive joint mobilisation in isolation for ankle sprains. Studies investigating grade 1 or 2 lateral or medial ankle sprains in any pathological state from acute to chronic, that had been treated with passive joint mobilisation were included. Eleven databases were searched from inception to February 2016. Extracted clinically relevant outcomes were assessed for their effectiveness at immediate, short and long-term follow-up.

Results:

1514 abstracts and subsequently 55 full-text articles were screened. Twenty-three studies on sub-acute and/or chronic sprains were included in the systematic review and 11 in the meta-analysis. The outcomes evaluated were dorsiflexion range, proprioception, balance, pain threshold, pain intensity, and function. The majority were measured immediately after mobilisation.

Meta-analysis of studies evaluating passive joint mobilisation for chronic sprains revealed statistically significant immediate benefits of mobilisation compared to comparators on improving overall dynamic balance ( $p < 0.0001$ ), but not for improving dorsiflexion range ( $p = 0.16$ ), static balance ( $p = 0.96$ ) or pain intensity ( $p = 0.45$ ). There were significant benefits in the short term for improving weight-bearing dorsiflexion range ( $p = 0.003$ ) compared to comparators.

Conclusion/Key Practise Points:

- Clinicians may consider applying passive joint mobilisation when treating patients with chronic ankle sprains, because it is immediately beneficial for dynamic balance and for dorsiflexion range of motion in the short-term.
- Evidence for long-term benefits of passive joint mobilisation is lacking in the literature.

**THERE IS A CLEAR EVIDENCE-PRACTICE GAP IN THE MANAGEMENT OF COMMON KNEE CONDITIONS: A SURVEY OF AUSTRALIAN AND CANADIAN PHYSIOTHERAPISTS**

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MPA8C, Meeting Room C4.5, October 20, 2017, 4:40 PM - 5:25 PM

Aim:

Determine the knowledge, and confidence of physiotherapists in managing two common knee conditions – knee osteoarthritis (OA) and patellofemoral pain (PFP).

Design:  
Survey

Method:

116 physiotherapists, varying in years of experience ( $<5=39\%$ ,  $5-10=34\%$ ,  $11-15=7\%$ ,  $> 15=19\%$ ), from Australia ( $n=64$ ) and Canada ( $n=52$ ) were recruited via social media, email, and engagement with a Physiopedia course. Each completed an online survey (November 2016-March 2017) evaluating knowledge of evidence, and confidence in using common treatments for knee OA and PFP. Results were compared against published guidelines including OARSI (knee OA) and the International Consensus Statement (PFP).

Results:

Awareness of supporting evidence for exercise was generally good (89-96%). However, 20% and 21% reporting average or lower confidence for prescribing quadriceps and proximal exercise respectively. A number of physiotherapists were confident in using low value passive treatments for knee OA and PFP, including ultrasound (43%), and massage (65%), despite the majority (77-91%) being aware of limited-absent supporting evidence. 62% were aware of supporting evidence for foot orthoses in managing PFP, while only 18% were confident in prescribing to patients.

A large number of physiotherapists were unaware that arthroscopy is not supported by evidence for knee OA (46%) and PFP (44%).

Conclusion/Key Practice Points:

- Physiotherapists require improved access to contemporary evidence to facilitate knowledge translation.
- Knowledge gaps related to surgical management and passive treatments for knee conditions are concerning.
- Provision of active educational interventions including workshops and online multimedia resources are recommended to bridge clear evidence practice-gaps in knee OA and PFP.

## A QUALITATIVE EVIDENCE SYNTHESIS OF PRIMARY CARE CLINICIANS' VIEWS ON OSTEOARTHRITIS MANAGEMENT

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MPA8C, Meeting Room C4.5, October 20, 2017, 4:40 PM - 5:25 PM

Aim:

To identify and synthesise the available evidence on primary care clinicians' views on barriers and enablers to providing recommended management of osteoarthritis.

Design:

Systematic review and meta-synthesis of qualitative studies.

Method:

This qualitative evidence synthesis identified reports from five databases (searched to August 2016) that included data collected directly from primary care clinicians using qualitative methods for both data collection and analysis. Two independent reviewers identified eligible reports, conducted the critical appraisal of study conduct, and extracted the data. Data were synthesised and interpreted by three reviewers through an inductive and iterative process to derive new themes and theories for change.

Results:

Eight studies involving approximately 83 general practitioners, 24 practice nurses, 12 pharmacists and 10 physiotherapists, from Australia, France, UK, Germany and Mexico were included. Four barriers were identified as themes 1) OA is not that serious, 2) Clinicians are, or perceive they are, under-prepared, 3) Personal beliefs at odds with providing recommended practice, and 4) Dissonant patient expectations. No themes were enablers. Some differences between physiotherapist and general practitioner attitudes were identified, in particular regarding optimism and expectation of treatment outcomes.

Conclusion/Key Practice Points:

- The findings collectively point towards a need to address clinician knowledge gaps and enhance clinician communication and behaviour change skills to facilitate patient adherence, enable effective conversations and manage dissonant patient expectations.
- The study findings also highlight that current care is neglecting chronic disease self-management principles and person-centeredness, and organisational-level and culture changes are also needed.

Trial Registration: PROSPERO CRD42015027543

## ADDITION OF TRANSCRANIAL DIRECT CURRENT STIMULATION TO QUADRICEPS STRENGTHENING EXERCISE IN KNEE OSTEOARTHRITIS: A PILOT RANDOMISED CONTROLLED TRIAL

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MPA8C, Meeting Room C4.5, October 20, 2017, 4:40 PM - 5:25 PM

### Aim:

To assess the safety and feasibility of adding transcranial direct current stimulation (tDCS) to quadriceps strengthening exercise in knee osteoarthritis, and to provide data to inform a fully powered trial.

### Design:

A preliminary randomised, assessor- and participant-blind, sham-controlled trial

### Method:

Participants were randomised to receive an 8-week exercise programme comprising twice weekly physiotherapy sessions supplemented with either active tDCS ('stimulation + exercise') or sham tDCS ('exercise alone') and a home exercise programme. Feasibility, safety, pain (100-mm visual analogue scale), function (WOMAC questionnaire), and quantitative sensory tests were assessed before and after treatment.

### Results:

Fifty-seven people were screened for eligibility, 30 entered randomisation and 25 completed the trial with two mild adverse events. Pain reduction in the 'stimulation + exercise' group (mean: -41.4 mm, 95%CI: -30.7 to -52.2) was double that observed with 'exercise alone' (-20.7 mm, -7.1 to -34.3). Function improved in the 'stimulation + exercise' group (-10.9 units, -3.3 to -18.5) to a greater extent than with 'exercise alone' (-4.91 units, 0.2 to -10.0). Overall, greater improvements in quantitative sensory tests were observed in the 'stimulation + exercise' group than with 'exercise alone'.

### Conclusion/Key Practice Points:

- We provide safety and feasibility data on the addition of tDCS to quadriceps strengthening exercise in knee osteoarthritis.
- The combined treatment may improve pain, function and pain mechanisms beyond that achieved with exercise alone.
- tDCS could be easily integrated into physiotherapy practice if beneficial effects on knee osteoarthritis are established in a future fully powered trial.

## UPPER AND LOWER LIMB KINEMATICS USING THE MICROSOFT KINECT: RELIABILITY AND VALIDITY IN PEOPLE WITH ACQUIRED BRAIN INJURY

Kahn M<sup>1,2</sup>, **Mentiplay B<sup>1,2</sup>**, Williams G<sup>2,3</sup>, Bower K<sup>1</sup>, Banky M<sup>1,2</sup>, Olver J<sup>2</sup>, Clark R<sup>1</sup>

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NNG8A, Meeting Room C4.7, October 20, 2017, 4:40 PM - 5:25 PM

### Aim:

To establish the test-retest reliability and concurrent validity of the Microsoft Kinect compared to the criterion-reference three-dimensional motion analysis for quantifying upper and lower limb kinematics during gait in people with acquired brain injury.

### Design:

Observational study

### Methods:

Twenty people with chronic acquired brain injury with gait abnormalities and upper limb associated reactions were recruited. All participants underwent gait analysis with an Optitrack three-dimensional motion analysis system and the Microsoft Kinect on two testing occasions, one-week apart. Four trials at self-selected walking

speed were recorded. Mean, standard deviation, maximum, minimum and total joint range of motion were captured for the upper and lower limb joint axes. Correlation coefficients reported the association between the two systems for concurrent validity and between sessions for the Microsoft Kinect's test-retest reliability.

#### Results:

The Microsoft Kinect displayed excellent concurrent validity ( $r > 0.7$ ) for shoulder flexion range of motion, shoulder abduction mean and maximum, elbow flexion maximum, hip flexion maximum and all measures of knee flexion for the affected limbs. The Microsoft Kinect displayed excellent test-retest reliability ( $r > 0.8$ ) for all angles for the upper and lower limb.

#### Conclusion/Key Practice Points:

- The low-cost Microsoft Kinect displays promising validity to three-dimensional motion analysis for key kinematic variables for associated reactions of the upper limb
- The Microsoft Kinect is highly reliable across testing sessions
- Investigation into this tool's responsiveness is warranted to determine its clinical usefulness
- The Microsoft Kinect is unable to capture data for the forearm, wrist and ankle joints.

#### ASSESSING SPASTICITY WITH INNOVATIVE TECHNOLOGIES IN A CLINICAL SETTING: A HEALTHY CONTROL VALIDATION AND UTILITY STUDY

**Banky M<sup>1,2</sup>**, Clark R<sup>1</sup>, Mentiplay B<sup>1</sup>, Kahn M<sup>1,2</sup>, Olver J<sup>2</sup>, Williams G<sup>2,3</sup>

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NNG8A, Meeting Room C4.7, October 20, 2017, 4:40 PM - 5:25 PM

#### Aim:

To establish the ecological and concurrent validity of three technological methods for assessing lower limb spasticity

#### Design:

Observational study

#### Methods:

Thirty-five healthy adults underwent a Modified Tardieu assessment of their quadriceps, hamstrings, gastrocnemius and soleus. Three slow (V1) and fast (V3) trials were completed for each muscle. Each trial was recorded simultaneously by the Optitrack three-dimensional motion analysis system, Smartphone and Microsoft Kinect. A goniometer was also used to measure the end angle. A trial was deemed ecologically valid when the joint range of motion and speed of assessment matched the relevant lower limb movement and speed during the stage of the gait cycle where spasticity is likely to be triggered. Correlation coefficients were used to investigate the concurrent validity of the measurement systems for the start angle, end angle, total range of motion and peak angular velocity for each movement.

#### Results: A

Il methods demonstrated good ecological validity for testing speed and range of motion. The concurrent validity between the three systems was excellent ( $r > 0.7$ ) with the exception of the start and end angles for the Smartphone ( $r < 0.5$ ). The goniometer had a moderate relationship with the Optitrack end angles ( $r = 0.5-0.8$ ).

#### Conclusion/Key Practice Points:

- Ecological validity may be an important component of spasticity assessment
- Investigations are warranted in a clinical population to ascertain whether these innovative technologies may be able to further standardise spasticity assessment
- The Smartphone and Microsoft Kinect demonstrated excellent concurrent validity with the Optitrack for measuring range of motion and angular velocity.

## IS LOW COST ELECTROMYOGRAPHY CLINICALLY FEASIBLE? CONCURRENT VALIDITY OF A <\$50 ELECTROMYOGRAPHY CHIP WITH A COMMERCIAL SYSTEM

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NNG8A, Meeting Room C4.7, October 20, 2017, 4:40 PM - 5:25 PM

### Aim:

To determine the concurrent validity during lower limb exercises of a low cost, simple to implement EMG on-a-chip with a commercial system.

### Design:

Concurrent validity study.

### Methods:

10 healthy women (age 28.1±6.8 yrs, 162.1±6.8 cm, 60.3±10.2 kg) were assessed concurrently with an electromyography system incorporating an off the shelf EMG on-a-chip (Myoware muscle sensor) and a commercial system (Noraxon Telemyo DTS) during maximal voluntary isometric contraction, active knee extension, squatting, stepping up and jumping. Two sets of electrodes were placed end to end in a random order along the same line of muscle fibres of Vastus Lateralis. Data from both systems were acquired at 2000Hz, with the raw signals amplified, filtered, rectified and smoothed to obtain mean and peak activation intensities.

### Results:

Modest to excellent relative agreement (Pearson's  $r$ ) was found in all exercises between the two electromyography systems; active knee extension ( $r=0.87-0.93$ ), squats ( $r=0.61-0.80$ ), step-ups ( $r=0.76-0.92$ ) and jumping ( $r=0.77-0.89$ ). Visual inspection of time/frequency characteristics using spectrograms of the signals showed similar patterns, albeit with some noticeable differences with respect to noise characteristics, which had little effect on the time domain results.

### Conclusion/Key Practice Points:

- Low cost on-a-chip electromyography systems can provide a valid assessment of quadriceps activity in lower limb exercises when compared with commercial system as the criterion reference.
- Flexible low cost on-a-chip electromyography systems when used with microprocessors and custom software have potential to be used clinically for the assessment of muscle activity and biofeedback.

## RESISTANCE TRAINING TO IMPROVE MOBILITY AFTER STROKE AND ADHERENCE TO THE AMERICAN COLLEGE OF SPORTS MEDICINE GUIDELINES: A SYSTEMATIC REVIEW.

**Hendrey G<sup>1,2</sup>**, Holland A<sup>1,2</sup>, Mentiplay B<sup>3,4</sup>, Clark R<sup>3</sup>, Williams G<sup>4,5</sup>

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NNG8B, Meeting Room C4.10, October 20, 2017, 4:40 PM - 5:25 PM

### Aim:

To determine whether resistance training interventions to improve walking outcomes after stroke adhere to the American College of Sports Medicine guidelines, and whether adherence was associated with better outcomes.

**Design:**

A systematic review of randomized controlled trials examining the impact of lower limb strength training on mobility outcomes in adult stroke participants. Online databases were searched from 1975 to 30 October 2016.

**Method:**

Two independent reviewers completed data extraction. Quality of trials was determined using the Cochrane Risk of Bias Tool. Trials were scored based on their protocol's adherence to eight American College of Sports Medicine recommendations. To determine if a relationship existed between overall adherence score and effect size, Spearman's rho (rs) was calculated.

**Results:**

Thirty-nine trials met the inclusion criteria and 34 were scored on their adherence to the guidelines. Adherence was high for frequency of training (100% of studies) but few trials adhered to the guidelines for intensity (32%), specificity (24%), and training pattern (3%). Based on the small number of studies that could be included in pooled analysis (n = 12), there was no significant relationship between overall adherence and effect size (rs = -0.39, p = 0.21).

**Conclusion/Key Practice Points:**

- Adherence to the American College of Sports Medicine guidelines for resistance training following stroke varied widely.
- Future trials should ensure strength training protocols adhere more closely to the guidelines, to ensure their effectiveness in stroke can be accurately determined.

**AEROBIC EXERCISE TO IMPROVE COGNITION FOLLOWING STROKE: A FEASIBILITY STUDY**

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NNG8B, Meeting Room C4.10, October 20, 2017, 4:40 PM - 5:25 PM

**Aim:**

To investigate the feasibility of a 12-week aerobic exercise intervention on cognition, motor cortex excitability and cerebral circulation post-stroke.

**Design:**

Randomised controlled trial, with concealed allocation, assessor blinding and intention-to-treat analysis.

**Method:**

Participants were randomised to either a usual care control group or the aerobic exercise intervention. The exercise group attended a specialised fitness centre three times/week for 12 weeks and performed up to an hour of supervised aerobic exercise at each visit.

**Outcome measures:**

The primary outcomes were feasibility and a change in a composite cognitive score (based on executive function, speed of perception, memory and working memory). Secondary outcomes included aerobic capacity, cerebrovascular reactivity and cortical excitability.

**Results:**

Recruitment was difficult. After screening 108 stroke survivors, only 13 enrolled in the study, and 10 completed the 6-month follow-up assessments. Barriers to recruitment included time commitment and attitudes towards exercise. There were no adverse events from the exercise. Participants in the exercise group (n = 5) completed 85% of their exercise sessions, and demonstrated improved aerobic capacity during

a submaximal exercise test after the 12-week intervention by 1.3 mL/kg/min (95% CI 0.02 to 1.64), which was maintained at follow up (1.3 mL/kg/min; 95% CI 0.59 to 2.50), compared to controls. There was no significant change in the composite cognitive score.

Conclusion/Key Practice Points:

- Aerobic exercise is a safe and effective intervention to improve aerobic capacity following stroke.
- The intensive nature of this study contributed towards the lack of feasibility in proceeding to a larger trial.

## WHEN IS IT SAFE TO COMMENCE HIGH-LEVEL MOBILITY TRAINING AFTER A TRAUMATIC BRAIN INJURY: A SYSTEMATIC REVIEW

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NNG8B, Meeting Room C4.10, October 20, 2017, 4:40 PM - 5:25 PM

Aim:

To determine the timeframe for safe commencement of high-level mobility (HLM) exercise in people with moderate to extremely severe traumatic brain injury (TBI).

Design:

Systematic review.

Method:

A systematic review of 10 databases. Papers were included if they involved participants >15 years of age with moderate to extremely severe TBI, sustained less than three months before and included an intervention or outcome measure with HLM items (i.e. run, jump, hop). Data relating to TBI severity, time post injury, HLM items, adverse events and symptom exacerbation was extracted for review.

Results:

Twenty-one papers met the inclusion criteria. Twenty of these included a measure of HLM and one a HLM intervention only. Three papers used both a HLM intervention and measure. The measures used to evaluate HLM were the High-level Mobility Assessment Tool (15), Rivermead Mobility Index (1), Community Balance and Mobility Scale (1), 20m shuttle run (1), other HLM tasks (2). Sixteen of the 21 studies had participants commence HLM assessment or training before six-weeks post injury, with the earliest time to commence being three days. No studies stated in their methodology that they would monitor for adverse events or symptom exacerbation. Only one study, which involved a HLM intervention, reported an adverse event relating to symptom exacerbation.

Conclusion/Key Practice Points:

- Post-concussion symptoms are not routinely monitored or reported in HLM tasks after moderate to extremely severe TBI
- There is no consensus on a safe timeframe to commence HLM assessment or training after moderate to extremely severe TBI.

## THERAPY INFLUENCES GOAL ATTAINMENT FOLLOWING BOTULINUM NEUROTOXIN INJECTION FOR FOCAL SPASTICITY IN ADULTS WITH NEUROLOGICAL CONDITIONS

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NNG8C, Meeting Room C4.2, October 20, 2017, 4:40 PM - 5:25 PM

Aim:

To investigate the influence of therapy on outcome, in terms of goal attainment, following botulinum neurotoxin injection for focal spasticity in adults with neurological conditions.

Design:  
Prospective observational study.

Method:  
Participants were provided with a prescribed program following their injection designed to maximise their outcome. The rate of adherence to the program was examined to determine if adherence to therapy improved rehabilitation outcomes as measured by goal attainment. Clustered logistic regression, allowing for multiple goals per participant, was used.

Results:  
The 31 participants had a total of 76 goals. Active indications for treatment made up the majority of the goals (80.30%). Goals were achieved in 43 out of the 76 cases (56.60%; 95% CI = 42.40 to 69.80%). Therapy adherence was significantly associated with goal attainment (OR = 1.02, p = 0.03, 95% CI = 1.001 to 1.04). A higher adherence to therapy increased the odds of goal achievement for active indications but not for passive indications.

Conclusion:  
Therapy adherence was significantly associated with goal attainment. Active indications were most reliant on the prescription of adjunctive therapies following botulinum neurotoxin injection for focal spasticity in adults with neurological conditions. There was no statistically significant interaction between the location of the injection and adherence to therapy program on goal attainment.

Key Practice Points:

- Therapy influences goal attainment after botulinum toxin injection.
- Active indications are more reliant on the prescription of therapy than passive indications.

#### THE FUNCTIONAL GAIT ASSESSMENT INDEPENDENTLY PREDICTED FALLERS AFTER REHABILITATION AND ITEMS COULD GUIDE TASK PRACTICE FOR HOME AND COMMUNITY-BASED AMBULATION

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NNG8C, Meeting Room C4.2, October 20, 2017, 4:40 PM - 5:25 PM

Aim:  
To determine predictor variables for falls to prepare adults for home and community ambulation following discharge from out-patient rehabilitation.

Design:  
Prospective observational study.

Methods:  
People discharging from out-patient rehabilitation consented to complete a fall diary across 3-months and were followed-up. Variables monitored included age, gender, diagnosis, fall history, medications, mobility at discharge, use of aid, type of intervention, self-reported balance-confidence and physical performance measures (postural stability, TUG Test, gait speed, distance walked and the functional gait assessment (FGA)).

Results:  
Three hundred and fifty one adults (aged 68±15; range 20-94) with a mix of diagnoses (neurological 28%; vestibular 39%; ortho-geriatric problems / imbalance / general debility after hospitalisation 33%) participated. While multiple univariate variables were significantly associated with fallers (age, diagnostic group, fall history, baseline mobility aid, postural stability, baseline TUG comfy > 13.5s, gait speed < 15m/s, baseline FGA total ≤ 22), multivariable logistic regression revealed four independent factors predicted fallers: diagnosis, previous fall history (OR: 2.4; 95%CI: 1.2-5.1), FGA total ≤ 22 (OR: 3.3, 95%CI: 1.5-7.4) and use of mobility aids outdoors at baseline (OR 0.2; 95%CI: 0.1-0.6). Compared to vestibular patients, ortho-

geriatric (OR: 3.7; 95%CI: 1.4-9.8) and neurological patients (4.7; 95%CI: 2.3-9.7) were more likely to have a fall.

**Conclusions/Key Practice Points:**

- Physiotherapists need to consider multiple variables to predict fallers after discharge from rehabilitation.
- The FGA discharge total score was the only physical measure that independently predicted prospective fallers.
- FGA items could guide task practice of people preparing for home and community ambulation.

**CAN GAIT AND BALANCE MEASURES IDENTIFY CHANGE FROM A LUMBAR PUNCTURE TAP TEST IN PATIENTS WITH IDIOPATHIC NORMAL PRESSURE HYDROCEPHALUS?**

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NNG8C, Meeting Room C4.2, October 20, 2017, 4:40 PM - 5:25 PM

**Aim:**

Determine if a battery of gait and balance outcome measures can identify change for patients undergoing a lumbar puncture tap test (TT) diagnosed with idiopathic normal pressure hydrocephalus (iNPH).

**Design:**

Prospective cohort study of 74 patients undergoing a TT for consideration of surgery for iNPH.

**Method:**

Patients were assessed with the 10m walk test, timed up and go (TUG), Tinetti assessment and Berg balance, before and after a TT. Patients who improved were labelled responders and offered surgery. Patients who did not improve were labelled non-responders. Between group differences were analysed with sign-rank tests with significance levels of 0.05.

**Results:**

Median time to review after TT was 2 hours. Forty patients responded, 34 were non-responders. For responders significant change was identified for the TUG (3.98 seconds  $p<0.01$ ), Tinetti (3.88 points  $p<0.01$ ), Berg (5.29 points  $p<0.01$ ) and 10m walk (0.08m/sec  $p<0.01$ ). For non-responders significant change was identified for the Tinetti, (0.91 points  $p=0.01$ ) and Berg, (2.06 points  $p<0.01$ ). For non-responders, all change scores fell within established minimal detectable changes (MDC). For responders, the 10m walk change fell within established MDC's, questioning the clinical significance of these results.

**Conclusion/Key Practice Points:**

- This provides the first clear evidence to support a battery of outcome measures to identify change from a TT in iNPH
- The TUG, Berg balance and Tinetti assessment can identify change in patients undergoing TT.
- The 10m walk test does not appear to be sensitive in relation to the CSF TT with change scores below established MDC's.

## WHOLE BODY VIBRATION TRAINING FOR CHILDREN AND ADOLESCENTS WITH CONGENITAL MYOPATHY

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NPG8, Meeting Room C4.1, October 20, 2017, 4:40 PM - 5:25 PM

### Aim:

To evaluate the effect of 24 weeks of weight bearing vibration therapy on muscle strength and motor function in children with congenital myopathy

### Design:

Prospective cohort pilot study incorporating a six month observational period followed by six months of home-based weight-bearing vibration training

### Method:

Eight ambulant children with congenital myopathy aged 4-16 years were assessed at baseline, prior to starting vibration training and following training. Lower limb muscle strength was assessed with hand held dynamometry. Motor function was assessed with the Motor Function Measure and the six minute walk test. Paired t-tests were used to compare the change in outcomes between the observational and treatment period.

### Results:

There was a significant difference in the change in total lower limb muscle strength between the observational and treatment period (observation mean -1.3N, vibration mean 26.2N, mean difference 27.5N, 95% CI 1.2 to 53.8,  $p = 0.04$ ). There was no statistically significant difference in the change in the Motor Function Measure (observation mean -0.22, vibration mean 1.33, mean difference 1.55, 95% CI -4.6 to 7.78,  $p = 0.58$ ) or the six minute walk test (observation mean -4 m, vibration mean 33.3 m, mean difference 37.3 m, 95% CI -10.4 to 85,  $p = 0.1$ ). No adverse events were reported.

### Conclusion/Key Practice Points:

- Six months of weight bearing vibration therapy was safe and well tolerated in children with congenital myopathies
- Improvements were seen in both lower limb strength and the six minute walk test distance following vibration training.

## THE RELATIONSHIP BETWEEN FINE AND GROSS MOTOR PROFICIENCY IN SCHOOL-AGED CHILDREN: A RETROSPECTIVE CROSS-SECTIONAL STUDY.

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NPG8, Meeting Room C4.1, October 20, 2017, 4:40 PM - 5:25 PM

### Aims:

To examine the relationship between fine and gross motor proficiency in typically developing school-aged children and determine i) if gross motor proficiency could be a valid predictor fine motor proficiency and; ii) if age, gender and year of assessment were contributing factors to the relationship.

### Design:

Retrospective cross-sectional study.

#### Methods:

The motor proficiency of a retrospective sample (n = 306, 150 girls, 156 boys, mean age: 10.7 years) of school-aged children from South-East Queensland and Northern New South Wales, were assessed using the Bruininks Oseretsky Test of Motor Proficiency, 2nd Edition (BOT2).

#### Results:

One-way ANOVA revealed significant differences in motor proficiency for groups based on gender, years of data collection, and age. After accounting for these confounding factors, a multiple regression analysis revealed that gross motor proficiency alone accounted for 69% (SEE = 2.2%,  $p < 0.001$ ) of the variance in fine motor proficiency for typically developing children.

#### Conclusion/Key Practice Points:

- Gross motor proficiency is a very strong predictor of fine motor proficiency in typically developing school-aged children.
- These results are important for therapists, teachers, and parent(s)/carer(s) to consider as early identification of poor gross motor proficiency in prep/kindy and early education years could flag the need for detailed assessment of fine motor skills to assist with preventing future classroom difficulties such as writing, cutting, drawing etc.
- Gross motor proficiency is a very strong predictor of fine motor proficiency, and this information should be considered when designing and planning classroom and school-based activities in the early education years.

#### ASSOCIATIONS BETWEEN MOTOR PROFICIENCY AND ACADEMIC PERFORMANCE IN YEAR 1 SCHOOL CHILDREN: A CROSS-SECTIONAL STUDY

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NPG8, Meeting Room C4.1, October 20, 2017, 4:40 PM - 5:25 PM

#### Aim:

To examine the relationships between motor proficiency and academic performance in mathematics and reading in Year 1 children.

#### Design:

Cross-sectional study.

#### Method:

Fifty-five Year 1 children (boys: n = 25, girls: n = 30; mean age:  $6.79 \pm 0.42$  years) from two primary schools in New South Wales participated. Motor proficiency and academic performance in mathematics and reading were assessed using the Bruininks-Oseretsky Test of Motor Proficiency (2nd Edition) and the Weschler Individual Achievement Test II (Australian Edition), respectively. Pearson correlation and multiple regression analyses were conducted to examine relationships between these measures.

#### Results:

A moderate association was found between total motor proficiency and mathematical ability ( $r = 0.455$ ,  $p < 0.001$ ), along with a weak correlation between total motor proficiency and reading ability ( $r = 0.271$ ,  $p = 0.047$ ). Manual coordination, body coordination and strength and agility percentile ranks were not significant predictors of academic outcomes. However, fine manual control was a significant predictor of mathematics and reading ability, accounting for 28.2% and 18.3% of the variance in mathematics and reading ability respectively.

#### Conclusion:

Significant relationships exist between motor proficiency and academic performance, particularly in mathematics. Fine motor skills appear to be most strongly predictive of both mathematics and reading ability.

Key Practice Point:

- A role exists for physiotherapists in the early identification of children experiencing difficulty with motor skills as this may also impact academic performance during the early years of school.

## THE PATH TO INTERACTIVE ENGAGEMENT IN WORKPLACE WELLBEING - FROM KEYNOTES TO GAMIFICATION

**Bouvier A<sup>1</sup>**

*<sup>1</sup>Happy Body at Work, Australia*

OHP8, Meeting Room C4.3, October 20, 2017, 4:40 PM - 5:25 PM

Summary:

Anna-Louise Bouvier is the creator of award winning Happy Body at Work program. This joint venture with the ABC has rolled out to over 30000 employees in 80 public, private and govt sector organisations in Australia and internationally. She will explore their journey to creating innovative, scalable, evidence based wellbeing programs that are also delightful and interactive. She will present the results of post-doctoral research from Macquarie University into the efficacy of the programs and give participants strategy to transform their own wellbeing initiatives.

## ASSESSMENT AND MANAGEMENT OF CONCUSSION IN CHILDREN

**Makdissi M**

SPA8A, Darling Harbour Theatre, October 20, 2017, 4:40 PM - 5:25 PM

This invited presentation will provide a summary of the assessment and management of concussion in immature athletes. It will provide essential information for clinicians working with children and adolescents in at-risk sports. The key components of an on- and off-field concussion assessment for young athletes will be discussed. Management of concussion in this important age group will then be considered, with important differences in the management of concussion in children and adolescents, compared to mature athletes reported.

## HIP AND GROIN INJURY IN ADOLESCENTS

**Mosler A<sup>1</sup>**

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SPA8A, Darling Harbour Theatre, October 20, 2017, 4:40 PM - 5:25 PM

Background:

Hip and groin injury is a major cause of time-loss in adolescent athletes competing in various sports. It is particularly problematic in young football players, with injuries to the hip/groin region representing between 4.9 to 11% of all time-loss injuries experienced. The adolescent athlete is especially vulnerable to overuse groin injury during the period of peak height velocity, with apophysitis in various sites of the pelvis being a common presentation. Therefore, a team approach to load management, with consideration to biological maturity status, is essential to managing hip/groin injuries in the immature athlete.

Key Practice Points:

Following this presentation, participants will be able to:

- Discuss the epidemiology of hip/groin injury in adolescent athletes
- Describe the most common hip/groin injuries seen in these athletes
- Apply load management principles to the treatment of hip/groin injuries in adolescents.

## ACCELERATED RETURN TO SPORT AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION AND EARLY KNEE OSTEOARTHRITIS FEATURES AT ONE YEAR

Culvenor A<sup>1,2</sup>, Patterson B<sup>1</sup>, Guermazi A<sup>3</sup>, Morris H<sup>4</sup>, Whitehead T<sup>5</sup>, **Crossley K<sup>1</sup>**

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SPA8B, Meeting Room C3.3, October 20, 2017, 4:40 PM - 5:25 PM

### Aim:

To determine whether an accelerated return-to-sport (<10-months) after anterior cruciate ligament reconstruction (ACLR) is associated with increased odds of early knee osteoarthritis (KOA) features on MRI 1-year post-surgery, and to evaluate this relationship stratified by type of ACL injury (isolated or concurrent chondral/meniscal injury) and lower-limb function (good or poor).

### Design:

Cross-sectional

### Method:

3T MRI scans were obtained for 111 participants (71 males; age 30±8 years) 1-year post-ACLR, and specific early KOA features (bone marrow, cartilage, meniscal lesions) were assessed using MRI OA Knee Score. A self-report questionnaire recorded postoperative return-to-sport data (specific sport, postoperative month first returned). Logistic regression analyses evaluated the odds of early KOA features following an accelerated return-to-sport (<10-months vs. ≥10-months) in the total cohort, and stratified by ACL injury type and lower-limb function.

### Results:

Forty-six (41%) participants returned to competitive sport <10-months post-ACLR. An early return-to-sport was associated with increased odds of bone marrow lesions (odds ratio [OR] 2.7, 95%CI 1.2 to 5.8) but not cartilage (OR 1.2, 95%CI 0.5 to 2.6) or meniscal lesions (OR 0.8, 95%CI 0.4 to 1.8). In those with poor lower-limb function, early return-to-sport exacerbated the odds of bone marrow lesions (OR 5.2, 95%CI 1.7 to 15.7), whereas stratified analyses for ACL injury type did not reach statistical significance.

### Conclusion/Key Practice Points:

- An accelerated return-to-sport post-ACLR, particularly in the presence of poor lower-limb function may be implicated in post-traumatic KOA development.
- Clinicians should ensure optimal lower-limb function prior to permitting an early return-to-sport following ACLR.

## SHARED DECISION MAKING RARELY OCCURS DURING RETURN TO SPORT FOLLOWING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

**Patterson B<sup>1</sup>**, Crossley K<sup>1</sup>, Culvenor A<sup>1,2</sup>, Barton C<sup>1</sup>

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SPA8B, Meeting Room C3.3, October 20, 2017, 4:40 PM - 5:25 PM

### Aim:

This study explores real-world adherence to recommended (expert consensus) return to sport (RTS) practices following anterior cruciate ligament reconstruction (ACLR), including shared decision-making (SDM) and formal RTS testing following, alongside patient beliefs regarding SDM.

### Design:

Cross-sectional

### Methods:

91 participants (55 men, 36 women; aged 35.6+ 9.0) years completed a custom survey at five-years following ACLR. Survey questions related to reasons for RTS decision, who was involved in RTS decision-making, and

participation in formal physiotherapy/RTS testing. Descriptive statistics were calculated with nominal and ordinal data described as number (%).

#### Results:

At five years, 34% of participants had returned to pre-injury level sport, whilst 62% had returned to some kind of competitive sport. Participation in formal physiotherapy for greater than six months, and performance of formal RTS testing were 29% and 21% respectively. When asked who should be involved in the RTS decision (timing/readiness), 39% participants believed this should be “shared” (between patient and at least one medical professional), and 57% believed physiotherapists should be involved or as sole decider. However, only 14% of respondents reported their RTS decisions were shared with the surgeon or physiotherapist.

- Key Practice Points:
- Strategies to increase the frequency of SDM and formal RTS assessment in clinical practice should be explored.
- Improving SDM and RTS assessment frequency may improve physical and psychological confidence, quality of life and RTS outcomes.
- Improving physiotherapy access beyond six months may increase formal RTS assessment rates, and satisfy patients who believe physiotherapists should be involved in RTS decisions.

#### HEIGHTENED RISK OF KNEE REPLACEMENT SURGERY AFTER SPORTS-RELATED KNEE INJURY

**Kemp J<sup>1</sup>**, Ackerman I<sup>2,3</sup>, Bohensky M<sup>3</sup>, Crossley K<sup>1</sup>, de Steiger R<sup>3,4</sup>

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SPA8B, Meeting Room C3.3, October 20, 2017, 4:40 PM - 5:25 PM

#### Aim:

To quantify the risk of knee replacement (KR) up to 15 years after sports-related knee injury.

#### Design:

Cohort study involving data linkage.

#### Method:

A cohort was established for the state of Victoria through linkage of two key administrative datasets: the Victorian Admitted Episodes dataset (capturing all hospital admissions) and the Victorian Emergency Minimum Dataset (capturing all emergency department (ED) presentations). Sports injury presentations from 2000-2005 and KR admissions from 2000-2015 were identified using ICD-10-AM codes. The population attributable risk of KR for people with knee injury (compared to other sports injuries) was calculated using a standard formula. A Cox proportional hazards model estimated individual risk of KR using time to surgery data, with adjustment for potential confounders.

#### Results:

Over the 15-year study period there were 64,038 sports injuries (including 7,205 knee injuries) resulting in ED presentation or hospitalisation, and 326 KR procedures. Incidence of KR was 1.02% in the knee injury group and 0.51% in the non-knee injury group. Having a sports-related knee injury more than doubled the hazard of subsequent KR (hazard ratio 2.68, 95%CI 1.84 to 3.96). Among the overall cohort, 10.2% of KR were attributed to previous knee injury (13.5% of KR for people aged ≥40 years at time of injury).

#### Conclusion and Key Practice Points:

- Sports-related knee injury manifests in a significantly greater likelihood of KR surgery.
- Effective injury prevention is essential for containing this societal burden, and physiotherapists are well-placed to undertake appropriate risk assessment and implement injury prevention strategies.

## PELVIC FLOOR MUSCLE EXERCISES: EASILY ACCESSIBLE AND EFFECTIVE LOW-THRESHOLD TREATMENT

**Mørkved S<sup>1,2,3</sup>**

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WMPH8, Meeting Room C3.5, October 20, 2017, 4:40 PM - 5:25 PM

In 1948 Kegel was the first to report PFM exercises to be effective in the treatment of female urinary incontinence. Since then, several of RCTs have documented the effect of PFME in the treatment of different symptoms of pelvic floor dysfunction. PFME is recommended as first-line treatment for stress urinary incontinence, pelvic organ prolapse and erectile dysfunction. In addition, PFME is recommended in the treatment of urge- and mixed incontinence, anal incontinence and sexual dysfunction.

Clinical recommendations:

- Teach the patient about the PFM and PFM function.
- Explain correct PFM contraction. Allow the patient to practice before checking ability to contract and assessing PFM contraction.
- When able to contract, set up an individual home training programme: Build up to three sets of 10 close to maximum contractions per day. Supply the patient with an exercise diary or biofeedback with computerized adherence registration.
- If the patient is unable to contract, try manual techniques such as touch, tapping, massage and fast stretch or electrical stimulation.
- Follow-up with weekly or more often supervised training, individually or in groups.
- Follow development in PFM function closely, using responsive, reliable and valid assessment tools.
- In addition to the strength training, ask the patient to precontract and hold the contraction before and during coughing, laughing, sneezing and lifting.

## CLINICIAN ASSISTED PELVIC FLOOR EXERCISES COMPARED WITH PERICOACH™ ASSISTED PELVIC FLOOR EXERCISES FOR FEMALE STRESS INCONTINENCE: A RANDOMISED CONTROLLED TRIAL

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WMPH8, Meeting Room C3.5, October 20, 2017, 4:40 PM - 5:25 PM

Aim:

The primary aim of this study was to evaluate the efficacy of PeriCoach™ in females with predominant stress incontinence, and secondly, to evaluate impact on quality of life.

Design:

Multicentre randomised controlled trial, concealed allocation and per-protocol analysis.

Method:

Ethics approval was gained at each site. Women aged ≥18 years who met inclusion criteria were randomised to pelvic floor muscle training alone, or PeriCoach augmented training. Primary endpoint after 20 weeks training was ≥30% reduction in leakage in 24-hour pad weigh test. Secondary endpoints included Incontinence Quality of Life, Prolapse/Incontinence Sexual Questionnaire IUGA Revised, and pelvic floor muscle strength change. Change from baseline was compared using a Mixed ANOVA with group, week (4,20) and their interaction effects. N (%) of subjects with 1-point increase on the Modified Oxford Scale was compared.

Results:

Forty-seven women were randomised. Pelvic floor strength change of 1-point, and 30% pad weight reduction were achieved by both groups ( $p < 0.0001$ ) (56% vs 62%, and 37% vs 56% participants, both in favour of PeriCoach), though no significant difference between groups. PeriCoach participants reported improved

quality of life compared to control group ( $p=0.015$ ). Subscales, Psychosocial Impact ( $p=0.017$ ) and Social Embarrassment ( $p=0.052$ ), trended towards PeriCoach. Sexual satisfaction significantly favoured PeriCoach ( $p=0.006$ ).

Conclusion/Key Practice points:

- PeriCoach and pelvic floor muscle groups improved similarly in leakage reduction and pelvic floor strength.
- The use of PeriCoach resulted in greater sexual satisfaction and quality of life.
- PeriCoach is a web enabled vaginal sensor designed to augment pelvic floor muscle training.

Trial Registration: ACTRN12615000907549

## PATIENT REPORTED OUTCOME MEASURES FOR NOCTURIA

**Bower W<sup>1,2</sup>**, Rose G<sup>1</sup>, Denys M<sup>3</sup>, Whishaw D<sup>1</sup>, Khan F<sup>1,2</sup>, Everaert K<sup>3</sup>

<sup>1</sup>The Royal Melbourne Hospital, Melbourne, Australia, <sup>2</sup>The University of Melbourne, Melbourne, Australia,

<sup>3</sup>Ghent University Hospital, Ghent, Belgium

WMPH8, Meeting Room C3.5, October 20, 2017, 4:40 PM - 5:25 PM

Aim:

To identify variables that can be individualized as patient-reported outcome measures of nocturia treatment efficacy.

Design:

Prospective data collection from patients  $\geq 18$  years of age with nocturia of at least once per night, attending either a tertiary referral Continence Clinic in Melbourne or Urology Clinic in Ghent, Belgium.

Methods:

The sample consisted of 204 datasets (Melbourne = 113, Ghent = 91). Items in the datasets were derived from validated questionnaires. Exclusion criteria: end-stage renal failure, bladder cancer, previous pelvic radiotherapy, terminal malignancies and urinary catheterisation.

Descriptive analysis, univariate and multivariate logistic regression were performed. Variables independently predictive of high frequency nocturia and significant bother were identified and formatted into patient-reported outcome measures.

Results:

Variables predictive of nocturia  $\geq 2$  per night: high bother (OR 7.34); daily urgency (OR 5.29); short time to first waking (OR 0.26); low sleep efficiency (OR 2.37); breathing dysfunction (OR 5.94) and poor sleep quality (OR 2.37). Predictors of high nocturia-related bother were: poor sleep quality (OR 4.13), short time to first waking (OR 0.60), daily urgency (OR 2.78), high nocturia frequency (OR 1.70) and weekly use of sleep medication (OR 2.24). Eight outcome measures addressing 3 domains of importance to individual patients were developed: sleep (efficacy, quality, and need for medication), lower urinary tract (urgency, time to first waking) and wellbeing (nocturia-related bother, daytime sleepiness and loss of enthusiasm).

Conclusions:

This is the first study to report measurement of change in variables of importance to patients with nocturia. These measures sit alongside self-reported nocturia frequency.

## HOW DIGITAL DISRUPTION IS IMPACTING HEALTH SERVICE DELIVERY

**Smith S<sup>1</sup>**

<sup>1</sup>Southern Cross University, Coffs harbour, Australia

Plenary 4, Darling Harbour Theatre, October 21, 2017, 8:30 AM - 10:00 AM

Throughout the world, traditional systems for provision of goods and services are undergoing significant transformation through the use of technologies that empower and connect an increasingly mobile population

of consumers. Uber is redefining taxi services without owning any vehicles, AirBnB makes more beds available per night in any major city than hotel chains without a single bricks and mortar asset, Netflix and other streaming media services have seriously impacted upon free-to-air television and video-rental businesses. These innovative businesses, and many like them, have restructured the value chain of traditional industries and threaten to put their traditional counterparts out of business where they have not already done so. At the core of the restructuring of value are consumers now having access to digital platforms that enable greater choice and flexibility about how to engage with suppliers of products and services? Bower and Christensen (1995) developed the concept of 'disruptive innovation' to describe how previously successful organisations can fail as a consequence of not adequately responding to the challenge posed by these innovators. In this presentation we will explore how digital disruption is impacting health service delivery and provide some specific examples relevant to allied health.

## THE PATIENT WILL SEE YOU NOW

**Bennell K<sup>1</sup>**

<sup>1</sup>*The University of Melbourne, Melbourne, Australia*

Plenary 4, Darling Harbour Theatre, October 21, 2017, 8:30 AM - 10:00 AM

Chronic conditions impose a significant burden on individuals and health systems across Australia. Self management is a key aspect of optimal chronic disease care with conservative treatments such as exercise and weight loss playing a major role. Working within a patient-centred framework, the patient is seen as the expert with the physiotherapists' role to support the patient to self manage.

However, there is evidence for a number of these conditions that care is suboptimal both in Australia and overseas. Other than system barriers to care including workforce limitations and suboptimal funding models, gaps in care can be loosely divided into clinician- and patient-related gaps. Clinician gaps can include use of non-evidence based treatments, overuse of unnecessary investigations and suboptimal clinical practice approach. Patient-related gaps include misconceptions about their condition and its management, lack of confidence to participate in decision making about their treatment, and lack of uptake and adherence to lifestyle behaviours particularly exercise. Addressing these gaps is important to improve care and outcomes for patients with chronic conditions. Furthermore, different models of service delivery are needed in order to support self management and to ensure access to services for people across Australia.

This oration will discuss the role of physiotherapy in the management of chronic conditions with an emphasis on a biopsychosocial approach, patient-centred care, supporting self management and alternate models of service delivery. Examples will be provided from our research in the area of osteoarthritis.

## INSPIRATORY MUSCLE TRAINING FOR INTENSIVE CARE PATIENTS: TRANSLATING EVIDENCE INTO PRACTICE IN YOUR ICU AND BEYOND

**Bissett B<sup>1</sup>**

<sup>1</sup>*University of Canberra, Bruce, Australia*

CRP9A, Meeting Room C3.4, October 21, 2017, 10:35 AM - 11:35 AM

### Background:

Patients in intensive care frequently develop inspiratory muscle weakness due to prolonged mechanical ventilation. We have demonstrated that inspiratory muscle training is safe in selected ventilator-dependent patients. A systematic review showed that inspiratory muscle training increases the likelihood of weaning success in ventilator-dependent patients. Furthermore, our recent randomised trial demonstrated that inspiratory muscle training following ventilatory weaning improves quality of life. However, inspiratory muscle training is not yet common practice in most intensive care units.

### Aims:

To improve participants' abilities to identify patients suitable for inspiratory muscle training in intensive care. Participants will develop skills in measuring inspiratory muscle strength and prescribing inspiratory muscle training using a threshold device.

#### Approach:

Following an introduction focused on patient-selection (10 minutes), the presenter will demonstrate how to measure inspiratory muscle strength using a respiratory pressure metre, with and without a tracheostomy (5 minutes). Participants will then view a video of a patient completing inspiratory muscle training through a tracheostomy (5 minutes). Participants will practice prescribing inspiratory muscle training, using a threshold device, for different clinical scenarios (10 minutes). Finally the presenter will share practical tips for incorporating inspiratory muscle training in rehabilitation in intensive care and beyond (10 minutes). Learning materials include a prescription guide and training diary.

#### Key Practice Points:

Participants will be able to:

- Measure inspiratory muscle strength in ventilator-dependent and spontaneously breathing patients
- Prescribe inspiratory muscle training for suitable patients in intensive care
- Describe how to feasibly incorporate inspiratory muscle training in a whole-body rehabilitation approach.

#### RESPIRATORY FUNCTION, PEAK COUGH FLOW AND HISTORY OF RESPIRATORY TRACT INFECTION IN PEOPLE WITH NEUROMUSCULAR DISEASE

**Sheers N<sup>1,2,3</sup>**, Howard M<sup>1,2,3</sup>, Rautela L<sup>1,2</sup>, Chao C<sup>1,2</sup>, Rochford P<sup>1,2</sup>, Nicholls C<sup>2</sup>, Berlowitz D<sup>1,2,3</sup>

<sup>1</sup>Victorian Respiratory Support Service, Austin Health, Heidelberg, Australia, <sup>2</sup>Institute for Breathing and Sleep, Heidelberg, Australia, <sup>3</sup>The University of Melbourne, Parkville, Australia

CRP9A, Meeting Room C3.4, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

To determine the relationship between vital capacity, peak cough flow and past history of respiratory tract infection in people with neuromuscular disease.

#### Design:

Cross sectional baseline data from a randomised controlled trial investigating the effects of regular respiratory physiotherapy in neuromuscular disease.

#### Method:

Baseline measurements of respiratory function (vital capacity, unassisted and assisted peak cough flow) and history of chest infection within the preceding 12-months were obtained. Descriptive statistics and Pearson's correlations were performed. Independent sample t-tests were used to assess between group (with or without chest infection) differences in pulmonary function.

#### Results:

At the time of abstract submission, 35 participants have undertaken baseline data collection. Mean (SD) vital capacity, unassisted and assisted peak cough flow were 1509(966) mL, 173(61) L/min and 179(54) L/min respectively. Ninety-five percent of participants had an unassisted peak cough flow less than 270 L/min. Twenty people reported no infection in the past 12-months. There were group differences in unassisted peak cough flow between people who had versus had no recent infection (mean (SD) = 146(47) vs 194(63) L/min,  $p=0.017$ ). There was a moderate correlation between vital capacity and unassisted peak cough flow ( $r = 0.70$ ,  $R^2 = 0.48$ ).

#### Conclusion/Key Practice Points:

- Lower peak cough flows were observed in people who had experienced a respiratory infection, consistent with cough being an important risk indicator.
- The majority of participants had a peak cough flow lower than 270 L/min, the proposed threshold for prevention of respiratory tract infection, however despite this most individuals had not had a recent infection.

## PARENT, CHILD AND PHYSIOTHERAPIST PERCEPTIONS OF EFFECTIVENESS OF PARENT PERFORMED MANUALLY ASSISTED COUGH ON CHILDREN WITH NEUROMUSCULAR DISEASE.

**Pitcher A<sup>1,2</sup>**, Doumit M<sup>2</sup>, Harman M<sup>2</sup>, Butler J<sup>1</sup>

<sup>1</sup>Australian Catholic University, Sydney, Australia, <sup>2</sup>Sydney Children's Hospitals Network, Sydney, Australia

CRP9A, Meeting Room C3.4, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

To describe confidence and perceived effectiveness, of parents, children and therapists, in parent performed manually assisted cough.

### Design:

Descriptive, cross-sectional study.

### Method:

A questionnaire was used to interview 28 children (24 males, four females; aged 6-17 years) with neuromuscular disease, one of their parents (n=28) and two therapists attending outpatient clinics at two tertiary paediatric hospitals, to establish confidence and perceived effectiveness in parent performed manually assisted cough as well as confidence in parents' ability to retain the technique between clinic visits. Percentage agreement statistics determined whether the three respondent groups agreed about individual cases.

### Results:

Overall, 40% of parents, 52% of children and 46% of therapists were very confident in parents' ability to perform an effective manually assisted cough. Parents, children and therapists largely perceived parental manually assisted coughs to be somewhat effective (68%, 60%, and 57%, respectively). Approximately, half of parents (48%), children (52%) and therapists (50%) felt very confident in parents' ability to retain the technique between clinic visits. Interestingly, percentage agreement statistics indicate a reasonable proportion (30%) of pairs of respondents did not agree in their ratings.

### Conclusion/Key Practice Points:

- Overall, high percentages of favourable ratings were noted for all questions.
- It may be important for physiotherapists to ask parents and children about their perceptions of manual assisted cough effectiveness, so therapists are aware when perceptions do not match their own.
- This study provides valuable insights into assisting parents of children with neuromuscular disease to feel confident in supporting their child's respiratory management.

## ARE PARENTS OF CHILDREN WITH NEUROMUSCULAR DISEASE ABLE TO PERFORM AN EFFECTIVE MANUALLY ASSISTED COUGH ON THEIR CHILD?

**Kan A<sup>1,2</sup>**, Butler J<sup>1</sup>, Doumit M<sup>2</sup>, Harman M<sup>2</sup>

<sup>1</sup>Australian Catholic University, North Sydney, Australia, <sup>2</sup>Sydney Children's Hospital Network, Randwick, Australia

CRP9A, Meeting Room C3.4, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

To evaluate whether parents of children with neuromuscular disease are effective at applying a manually assisted cough, after being taught by a physiotherapist.

### Design:

A prospective cohort study.

### Method:

Children and their parents/caregivers were prospectively recruited from neuromuscular clinics in the Sydney Children's Hospital Network. Cough peak flow was the outcome measure used to evaluate cough strength. Children were eligible to participate if their unassisted cough peak flow at baseline was below 270 L/min, as this is the value where augmented cough techniques are recommended for use. Parents were taught a

manually assisted cough by a physiotherapist prior to being measured. Cough peak flow was measured in the following order; (1) during an unassisted cough as baseline (2) during a manually assisted cough performed by a physiotherapist, (3) during a manually assisted cough performed by a parent, and (4) during an unassisted cough post-intervention.

#### Results:

28 children were recruited (24 males, mean age  $11 \pm 3$  years) and all children completed the study. No clinically or statistically significant changes were found in cough peak flow following the application of a manually assisted cough by parents/caregivers (95% CI = -11–11 L/min) or by physiotherapists (95% CI = -6–14 L/min).

#### Conclusion/Key Practice Points:

- Parents/caregivers and physiotherapists may be ineffective at increasing cough peak flow in children with neuromuscular weakness when applying a manually assisted cough.
- Further research is warranted to guide recommendations in how best to equip parents/caregivers with the skills to help manage children with neuromuscular disease.

### EFFECTIVENESS OF PRE-OPERATIVE EXERCISE IN PATIENTS WITH CANCER: A SYSTEMATIC REVIEW WITH META-ANALYSIS

Steffens D<sup>1,2</sup>, **Beckenkamp P**<sup>3</sup>, Hancock M<sup>4</sup>, Solomon M<sup>1,2,5</sup>, Young J<sup>1,2,5</sup>

<sup>1</sup>Surgical Outcomes Research Centre (SOuRCe), Royal Prince Alfred Hospital, Sydney, Australia, <sup>2</sup>School of Public Health, The University of Sydney, Sydney, Australia, <sup>3</sup>Discipline of Physiotherapy, Faculty of Health Sciences, The University of Sydney, Sydney, Australia, <sup>4</sup>Discipline of Physiotherapy, Faculty of Medicine and Health Sciences, Macquarie University, Sydney, Australia, <sup>5</sup>Institute of Academic Surgery (IAS), Royal Prince Alfred Hospital, Sydney, Australia

CRP9B, Meeting Room C3.5, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

To investigate the effectiveness of pre-operative exercises in patients undergoing oncological surgery, on post-operative complications, length of hospital stay and quality of life.

#### Design:

Systematic review with meta-analysis.

#### Methods:

Randomised controlled trials investigating the effectiveness of pre-operative exercise (compared to no intervention, placebo or minimal intervention) for patients undergoing oncological surgery were searched using electronic databases and grey literature to November 2016. Outcomes included post-operative complications, length of hospital stay and quality of life. Methodological quality was assessed using the Cochrane 'Risk of Bias' tool and quality of evidence was assessed using the GRADE approach. Meta-analysis was performed using random-effects model.

#### Results:

Seventeen studies (reporting 6 forms of malignancies) involving 810 participants were included. There is moderate quality of evidence that pre-operative exercise, compared to control, significantly reduced cardiopulmonary complication (relative risk: 0.65, 95% confidence interval [CI]: 0.49 to 0.87) and length of hospital stay (mean difference [MD]: -2.86, 95%CI: -5.40 to -0.33) in patients undergoing lung resection. Pre-operative exercise was not effective in reducing length of hospital stay (MD: 2.00, 95%CI: -2.35 to 6.35) in patients with oesophageal cancer. Only individual studies reported quality of life, therefore a meta-analysis for this outcome was not possible.

#### Conclusion/Key Practice Points:

- There is moderate-quality evidence that pre-operative exercise is effective in reducing post-operative complications and length of hospital stay in lung cancer patients.
- The evidence that pre-operative exercise reduces complications, length of hospital stay and improves quality of life in other groups of patients undergoing oncological surgery remains inconclusive.

## A GOOD STEPPING STONE TO NORMALITY... ' EXPERIENCES OF AN ONCOLOGY REHABILITATION PROGRAM

**Dennett A<sup>1,2</sup>**, Reed M<sup>2</sup>, Peiris C<sup>1</sup>, Shields N<sup>1,3</sup>, Taylor N<sup>1,2</sup>

<sup>1</sup>La Trobe University, Bundoora, Australia, <sup>2</sup>Eastern Health, Box Hill, Australia, <sup>3</sup>Northern Health, Epping, Australia

CRP9B, Meeting Room C3.5, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

Explore the experience of cancer survivors completing a comprehensive cancer rehabilitation program.

### Design:

Qualitative study using semi-structured interviews and thematic analysis.

### Method:

A purposive sample of cancer survivors completing oncology rehabilitation were interviewed. Interviews were recorded and transcribed verbatim. Coding was completed by two reviewers independently. Thematic analysis based on a phenomenological approach was completed. Sampling continued until there was saturation of themes. A third reviewer was consulted to confirm themes.

### Results:

Thirteen cancer survivors (54% female, 38% breast cancer) were interviewed. The primary theme identified was the value of rehabilitation in helping people 'feel normal' during and after cancer treatment. Sub-themes included physical benefits, social support, psychological benefits, and awareness of rehabilitation. Oncology rehabilitation helped participants feel 'normal' (and better in themselves) by becoming physically active, regaining strength, fitness, confidence and motivation to return to things they previously enjoyed. Exercise gave people a sense of having control over their condition and survivors valued peer support of the group environment. Education sessions provided in the program were informative but not always relevant to patients. Patients were often actively seeking rehabilitation and noted poor awareness among health professionals about the rehabilitation program. Overall, oncology rehabilitation was described as an overwhelmingly positive experience.

### Conclusion/Key Practice Points:

- Oncology rehabilitation helps cancer survivors return to 'normal' and they enjoy social interaction with peers.
- Oncology rehabilitation programs promote physical activity among cancer survivors.
- More awareness about oncology rehabilitation is needed to improve access to patients.

## PHYSICAL ACTIVITY LEVELS AT COMMENCEMENT OF ACTIVE TREATMENT IN PEOPLE WITH INOPERABLE LUNG CANCER

**Edbrooke L<sup>1,10</sup>**, Aranda S<sup>2,3,10</sup>, Granger C<sup>4,5,10</sup>, McDonald C<sup>4,6,10</sup>, Krishnasamy M<sup>3,10</sup>, Mileschkin L<sup>7,10</sup>, Clark R<sup>8</sup>, Irving L<sup>9,10</sup>, Denehy L<sup>1,4,10</sup>

<sup>1</sup>University Of Melbourne, Parkville, Australia, <sup>2</sup>Cancer Council Australia, Sydney, Australia, <sup>3</sup>Department of Nursing, The University of Melbourne, Parkville, Australia, <sup>4</sup>Institute for Breathing and Sleep, Heidelberg, Australia, <sup>5</sup>Department of Physiotherapy, Melbourne Health, Parkville, Australia, <sup>6</sup>Department of Respiratory and Sleep Medicine, Austin Health, Parkville, Australia, <sup>7</sup>The Peter MacCallum Cancer Centre, Melbourne, Australia, <sup>8</sup>The University of the Sunshine Coast, Sunshine Coast, Australia, <sup>9</sup>Department of Respiratory and Sleep Medicine, Melbourne Health, Parkville, Australia, <sup>10</sup>Victorian Comprehensive Cancer Centre, Melbourne, Australia

CRP9B, Meeting Room C3.5, October 21, 2017, 10:35 AM - 11:35 AM

### Aims:

In people with inoperable non-small cell lung cancer (NSCLC), to 1) determine physical activity (PA) levels and associations with exercise capacity, strength and symptoms; and 2) assess the efficacy of home-based, multi-disciplinary exercise and symptom management.

**Design:**

Multi-site, randomized controlled trial with concealed allocation, assessor blinding and intention-to-treat analysis. Baseline whole group data on the first 47 participants is reported in this abstract (aim 1). In addition, full primary outcome results (aim 2) will be presented at the conference.

**Method:**

The primary outcome was change in exercise capacity (six-minute walk test (6MWT)) from baseline to post-program. Secondary outcomes included PA levels (motion sensors and self-report), quadriceps strength and symptoms.

**Results:**

Baseline (n=47), disease stage (n) (IA 1, IIB 1, IIIA 11, IIIB 9, IV 25), mean(SD) age 63.6(12.4) years, BMI 26.2(4.7), sex 51% male, 45% undergoing radical treatment, wore motion sensors for 7-days. Objective data: median (IQR) daily step count was 3116 (2296 to 4825) and 93% (88 to 97%) of time was spent in sedentary behaviours. PA self-report showed 67% (29/43) did not meet guidelines. 6MWT mean (SD) was 483 m (112), 72% of predicted normative values. Associations between step count and self-reported PA ( $\rho=0.41, p=0.003$ ), exercise capacity ( $\rho=0.48, p=0.001$ ), quadriceps strength ( $\rho=0.33, p=0.02$ ) and symptoms (fatigue  $\rho=-0.31, p=0.04$ , dyspnea  $\rho=-0.28, p=0.06$ ) were fair.

**Conclusion/Key Practice Points:**

- People with inoperable NSCLC, commencing active treatment, demonstrate low PA levels.
- The discrepancy between exercise capacity and PA levels indicate supportive care interventions may assist in maintaining function and ameliorating symptoms.

Trial registration: ACTRN12614001268639

Funding: NHMRC.

**FUNCTIONAL DECLINE FOLLOWING ALLOGENEIC STEM CELL TRANSPLANTATION MAY BE IMPROVED WITH STRUCTURED EXERCISE**

**Abo S<sup>1</sup>**, Ritchie D<sup>2</sup>, Panek-Hudson Y<sup>2</sup>, Denehy L<sup>3</sup>, Irving L<sup>4</sup>, Granger C<sup>1,3</sup>

<sup>1</sup>Department of Physiotherapy, Royal Melbourne Hospital, Parkville, Australia, <sup>2</sup>Department of Clinical Haematology and Bone Marrow Transplant, Royal Melbourne Hospital and Victorian Comprehensive Cancer Centre, Parkville, Australia, <sup>3</sup>Department of Physiotherapy, The University of Melbourne, Parkville, Australia, <sup>4</sup>Respiratory and Sleep Medicine, Royal Melbourne Hospital, Parkville, Australia

CRP9B, Meeting Room C3.5, October 21, 2017, 10:35 AM - 11:35 AM

**Aim:**

To measure changes in physical function and health related quality of life in patients from pre- to 60-days post allogeneic stem-cell transplantation; to investigate the feasibility of an 8-week exercise program post-transplantation; and to measure changes in patient outcomes before and after the program.

**Design:**

Prospective case series.

**Method:**

43 patients undergoing allogeneic stem-cell transplantation were included. The intervention was an 8-week outpatient and home-based exercise and education program. Outcomes included exercise capacity (incremental shuttle walk test), self-reported physical activity and health-related quality of life measured pre-transplant, 60-days post-transplant (pre-intervention) and 100-days post-transplant (post-intervention).

**Results:**

The consent rate was 93%. From baseline to 60-days post-transplantation there was significant decline in exercise capacity (mean difference 224 meters, 95%CI 153 to 295,  $p < 0.0005$ ), self-efficacy for physical activity ( $p = 0.001$ ) and quality of life ( $p < 0.0005$ ). Ten participants did not commence the exercise program due to death, illness or cancellation of transplant. Following intervention, there was significant improvement in exercise capacity (mean difference 152 metres, 95%CI 76 to 227,  $p = 0.001$ ) and quality of life ( $p = 0.001$ ). No adverse events occurred.

#### Conclusion/Key Practice Points:

- Allogeneic stem-cell transplantation results in significant physical impairments and poor quality of life, which may be improved through structured exercise.
- The high consent rate shows the willingness of patients to consider exercise in their recovery.
- Not all patients were well enough to commence exercise at 60 days post-transplantation. Commencing exercise pre-transplantation may improve this.
- Further research is required.

#### VALIDITY OF MULTIPLE ACTIVITY MONITORS FOR MEASURING STEPS IN AN INPATIENT REHABILITATION POPULATION

**Treacy D<sup>1,2</sup>**, Hassett L<sup>1</sup>, Schurr K, Chagpar S<sup>1</sup>, Paul S<sup>1</sup>, Sherrington C<sup>1</sup>

<sup>1</sup>*School of Public Health, University of Sydney, , Australia*, <sup>2</sup>*Prince of Wales Hospital, SESLHD, Randwick, Australia*

GPA9, Meeting Room C3.6, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

To determine the validity of commonly used activity monitors for measuring step counts in rehabilitation inpatients compared to visually-observed step counts. To explore the influence of gait parameters, activity monitor position and walking frame use on activity monitor accuracy.

#### Methods:

166 inpatients admitted to a rehabilitation unit with an average walking speed of 0.4 m/s (SD 0.2) were recruited from the Bankstown General Rehabilitation Unit and Stroke Unit, Australia. Each participant wore 16 activity monitors (seven different devices in different positions) simultaneously during 6-minute and 6-metre walks. The number of steps taken during the tests was also counted by a physiotherapist. Gait parameters were assessed using the GAITRite system.

#### Results:

The StepWatch Activity Monitor (intraclass correlation coefficient (ICC<sub>2,1</sub> = 0.98), Fitbit One on the ankle (ICC<sub>2,1</sub> = 0.92) and the ActivPAL (ICC<sub>2,1</sub> = 0.78) all showed excellent agreement with the visual step count. All other devices showed poor agreement with the visual step count. Percentage agreement was closest for StepWatch steps compared to visual count (mean 98%). All devices were less accurate at slower gait speeds and shorter strides but the StepWatch Activity Monitor and the Fitbit One worn on the ankle maintained the best accuracy overall.

#### Conclusion:

The StepWatch showed the highest accuracy and closest agreement with the visual count of all the devices assessed in this study. The Fitbit One used on the ankle showed high agreement with the visual count and provides immediate feedback to the patient.

## INTERNET-DELIVERED PHYSIOTHERAPIST-PRESCRIBED EXERCISE AND PAIN COPING SKILLS TRAINING FOR PEOPLE WITH CHRONIC KNEE PAIN (IMPACT-KNEE PAIN): RANDOMIZED CONTROLLED TRIAL

**Bennell K<sup>1</sup>**, Nelligan R<sup>1</sup>, Dobson F<sup>1</sup>, Rini C<sup>2</sup>, Keefe F<sup>3</sup>, Kasza J<sup>4</sup>, French S<sup>5</sup>, Bryant C<sup>6</sup>, Dalwood A<sup>7</sup>, Abbott J<sup>8</sup>, Hinman R<sup>1</sup>

<sup>1</sup>Centre For Health, Exercise & Sports Medicine, The University of Melbourne, Melbourne, Australia,

<sup>2</sup>University of North Carolina, USA, <sup>3</sup>Duke University, Durham, USA, <sup>4</sup>Monash University, Melbourne, Australia, <sup>5</sup>Queen's University, Kingston, Canada, <sup>6</sup>The University of Melbourne and Royal Women's Hospital, Melbourne, Australia, <sup>7</sup>Physioworks Health Group, Melbourne, Australia, <sup>8</sup>University of Otago, Dunedin, New Zealand

GPA9, Meeting Room C3.6, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

Evaluate effectiveness of internet-delivered, physiotherapist-prescribed home exercise and pain coping skills training (PCST) for people with chronic knee pain.

### Design:

Pragmatic parallel-group, two-arm randomized controlled trial

### Method:

148 people aged ≥50 years with chronic knee pain were recruited from across Australia. The Intervention was delivered via the internet and included educational material, seven videoconferencing (Skype™) sessions with a physiotherapist for home exercise prescription and PCST program over 3 months. Control was internet-based educational material. Primary outcomes were walking pain (11-point numerical rating scale) and physical function (Western Ontario and McMaster Universities Osteoarthritis Index) at 3 months. Secondary outcomes were knee pain, quality-of-life, global change (overall, pain, functional status), arthritis self-efficacy, coping and pain catastrophizing. Measurements were also taken at 9 months.

### Results:

Of those enrolled, 139 participants (94%) completed primary outcomes at 3 months and 133 (90%) at 9 months: multiple imputation was used for missing data. The intervention group reported significantly greater improvement in pain (mean difference 1.6 units [95%CI 0.9 to 2.3]) and physical function (9.3 [5.9 to 12.7]) than controls at 3 months, which was sustained at 9 months (1.1 [0.4 to 1.8] and 7.0 [3.4 to 10.5] respectively). Intervention participants showed significantly greater improvement in most secondary outcomes than controls. At both time-points, significantly more intervention participants reported global improvements than controls.

### Conclusion/Key Practice Points:

- Internet-delivered, physiotherapist-prescribed exercise and PCST provide clinically meaningful improvements in pain and function for people with chronic knee pain that are sustained at least 6 months.

Trial Registration: ACTRN12614000243617

Funding: NHMRC#1091302

## APP-BASED SUPPLEMENTAL EXERCISE DURING INPATIENT ORTHOPAEDIC REHABILITATION INCREASES ACTIVITY LEVELS: A PILOT RANDOMISED CONTROL TRIAL

**Scrivener K<sup>1</sup>**, Bui T<sup>2</sup>, Llado A<sup>2</sup>, King C<sup>2</sup>

<sup>1</sup>Department of Health Professions, Macquarie University, Macquarie Park, Australia, <sup>2</sup>Royal Rehab, Ryde, Australia

GPA9, Meeting Room C3.6, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

To determine if an App-based supplemental exercise program in orthopaedic rehabilitation is feasible and acceptable to participants, can increase activity levels and improve functional outcomes.

**Design:**  
Single-centre, single-blind, pilot randomised control trial.

**Method:**  
All participants received usual-care orthopaedic rehabilitation and intervention participants received supplemental exercise via an App (PTPal™) on a tablet device. The primary outcome measures were patient satisfaction with App-based supplemental exercise, total repetitions and time in supplemental exercise programs. Secondary measures were: Ten Metre Walk Test; Six Minute Walk Test; Timed Up and Go; Functional Independence Measure and length of stay measured on admission and discharge from rehabilitation by a blinded assessor.

**Results:**  
Twenty eligible participants admitted for inpatient orthopaedic rehabilitation were recruited to the study. The results demonstrated high acceptance of the supplemental exercise program by participants. There was a statistically significant increase in the number of repetitions and exercise time performed by participants who received App-Based supplemental exercise program with an extra 549 reps (95% CI of 95-1002 reps  $p=0.020$ ) and increase in time of 157 minutes (95% CI 0.9-312.3  $p=0.049$ ).

**Conclusion:**  
An App-based exercise program increases activity levels, is feasible and is a safe and effective intervention with the potential to improve functional outcomes. Using an App has potential utility in other settings, to overcome resource limitations, standardise delivery of therapy and monitor participation and track progress. This pilot study should be followed with a larger study with more diverse diagnoses and greater impairments to determine its effectiveness.

#### MYMOVES FOR SENIORS – FEASIBILITY AND ACCEPTABILITY OF A PHYSICAL ACTIVITY SELF-MANAGEMENT PROGRAM FOR SENIORS WITH CHRONIC HEALTH CONDITIONS

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GPA9, Meeting Room C3.6, October 21, 2017, 10:35 AM - 11:35 AM

**Aims:**  
To explore the acceptability and feasibility of a remotely delivered physical activity self-management program for seniors living with one or more chronic health conditions.

**Design:**  
Single group design with pre-post outcomes measures.

**Method:**  
The myMoves program comprises 5 modules delivered over 6 weeks via email with participants supported with regular weekly contact via email with a physiotherapist. Pre- and post-program outcomes were assessed using online questionnaires, and intra-program data collected via clinician logs. Primary outcomes were feasibility (adherence, attrition, clinician time, accessibility and adverse events) and acceptability (satisfaction, worthiness of time and recommendation).

**Results:**  
The myMoves for seniors program currently has 47 enrolled participants aged 65 years and over residing in both metropolitan and rural areas of NSW. Arthritis and hypertension are the most common conditions reported by participants (62% and 49% respectively). Less than 20% of participants report being satisfied with their pre-program level of physical activity. Pain, fatigue, changes in physical abilities and an inability to access appropriate physical activity programs are all cited as common reasons for entering the myMoves program. All participants will complete the program by the end of June 2017, with full data to be presented at the conference.

**Conclusions:**

Seniors with chronic health conditions are commonly performing less physical activity than is recommended for optimal health and wellbeing. A remote self-management program offers a potential option for learning useful skills to assist with improving physical activity levels. The feasibility and acceptability of such a program will be analysed and presented.

#### SUPPORT FOR REFERRAL TO SPECIALIST PHYSIOTHERAPISTS IN MUSCULOSKELETAL HEALTHCARE: A QUALITATIVE ANALYSIS

**Bandong A<sup>1,2</sup>**, Leaver A<sup>1</sup>, Mackey M<sup>1</sup>, Sterling M<sup>3,4</sup>, Kelly J<sup>3,4</sup>, Ritchie C<sup>3,4</sup>, Rebbeck T<sup>1</sup>

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MPA9A, Meeting Room C4.8, October 21, 2017, 10:35 AM - 11:35 AM

##### Aim:

To explore healthcare practitioners' opinions about referral to specialist physiotherapists.

##### Design:

Qualitative study involving focus group discussions.

##### Methods:

The study involved primary care practitioners (n=16) and specialist physiotherapists (n=12) who treat people with whiplash associated disorders in New South Wales and Queensland, Australia. Discussions were audio recorded and verbatim transcripts produced. Thematic analysis was done to generate themes.

##### Results:

Six focus groups were conducted that generated 10 themes. Practitioners appeared to have good knowledge of indicators for referral and monitoring progress. Referrals were often made to the general practitioner, less commonly to specialist physiotherapists. There was general support for referral to specialists; however, practitioners had differing views around the defining attributes of specialists and referral timeframe. A number of factors have been identified to hinder or facilitate the referral process and practitioners expressed specific expectations of the desired outcomes of this referral. There was strong support for a collaborative approach in management that involved the referring practitioner. Practitioners identified key considerations that would influence decision to undertake any of the specialist management approaches.

##### Key Practice Points:

- This study suggested the potential for building the culture of referral to specialists that might improve management for people with complex musculoskeletal conditions like whiplash associated disorders.
- Participants were mostly supportive of the concept of referral to specialist physiotherapists, though not without recognised barriers.
- Practitioners expressed clear expectations of the desired outcomes of the referral process and favoured a collaborative shared-care approach in patient management.

#### POST-TRAUMATIC STRESS SYMPTOM CLUSTERS IN ACUTE WHIPLASH ASSOCIATED DISORDER AND THEIR PREDICTION OF CHRONIC PAIN-RELATED DISABILITY

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MPA9A, Meeting Room C4.8, October 21, 2017, 10:35 AM - 11:35 AM

Clinical practice guidelines for WAD advocate the evaluation of posttraumatic stress disorder (PTSD) symptoms by physiotherapists but it is not known which symptom clusters may be the most relevant.

**Aims:**

1) to explore the factor structure of the Posttraumatic Stress Diagnostic Scale (PDS) in patients with acute WAD; 2) to identify the PTSD symptom clusters that best predict 6 month neck pain-related disability.

**Design:**

Prospective longitudinal study.

**Methods:**

146 individuals with acute WAD completed the Neck Disability Index (NDI) and the PDS at baseline (<1month) and at 6 months post-injury. Principal component analyses (PCA) explored the factor structure of the PDS. Structural equation modelling was used to identify the cluster(s) that best predicted 6 month disability.

**Results:**

PCA generated two symptom clusters: Re-experiencing/Avoidance and Hyperarousal/Numbing. Nine trauma-related PTSD symptoms loaded exclusively on the Re-experiencing/Avoidance cluster and seven non-specific PTSD symptoms loaded exclusively on the Hyperarousal/Numbing cluster. One PTSD symptom (i.e. Inability to recall an important aspect of the trauma) did not load on either cluster. Structural equation modelling demonstrated a significant positive relationship between the Hyperarousal/Numbing symptom cluster and 6 month disability while no significant relationship was found for the Re-experiencing/Avoidance symptom cluster.

**Conclusion:**

Hyperarousal/Numbing symptoms may be the more relevant PTSD symptom cluster for health outcomes after whiplash injury. These symptoms are non-specific to PTSD and not necessarily related to the traumatic event (motor vehicle crash). They may be more related to the overall experience of having WAD. This has implications for assessment and management WAD.

## **LIVING WITH ON-GOING WHIPLASH ASSOCIATED DISORDER: INDIVIDUAL PERCEPTIONS AND EXPERIENCES**

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MPA9A, Meeting Room C4.8, October 21, 2017, 10:35 AM - 11:35 AM

**Aim:**

To explore participant perceptions and experiences of living with on-going whiplash associated disorder (WAD).

**Design:**

Qualitative study

**Methods:**

27 individuals (mean VAS=3.8+2.1) with chronic WAD (mean duration post injury=77+15 months) participated in semi-structured individual telephone interviews (each 30-40 minutes).

**Results:**

Inductive thematic analysis yielded two key themes. First, there was a need to navigate healthcare systems in search of a healthcare provider (HCP) that validated their injury and provided information and therapeutic strategies that matched individual's beliefs. Oftentimes this process was complicated by requirements of compensation systems, and, for some, constrained by monetary costs. Second, individuals described the journey of gradual realisation that their injury may be on-going, and the consequent process of trial and error to find the best sustainable strategies to both prevent and relieve symptoms.

#### Conclusion:

Recovery from a whiplash injury is an adaptive process and more than elimination of pain or disability, and therefore may be different from common clinical outcomes. Early identification of patient understanding of pain, expectations of recovery, and symptoms may help merge patient and HCP understandings. Additionally, helping individuals recognise symptom triggers and develop strategies to minimise triggers may actively engage patients in their recovery. Finally, acknowledgement and validation of the whiplash injury by HCPs is seen as a necessary step in the recovery process.

#### EVIDENCE-BASED CARE (EBC) IN HIGH- AND LOW-RISK GROUPS FOLLOWING WHIPLASH INJURY: A MULTI-CENTRE INCEPTION COHORT STUDY

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MPA9A, Meeting Room C4.8, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

To evaluate whether evidence based care (EBC) is differentially provided to people with whiplash, stratified for risk. Secondary aims were to determine whether risk status, receiving EBC and the therapeutic relationship, is associated with outcome at 3 months.

#### Design:

A multi-centre inception cohort study.

#### Methods:

160 people with acute whiplash (<28 days) presenting to hospital emergency departments/primary care participated. They completed baseline interviews assessing risk of non-recovery and validated health outcome questionnaires. At follow up (3 months), they completed questionnaires evaluating EBC, therapeutic relationship and recovery. Treating primary healthcare professionals (HCP) also completed questionnaires at 3-months. Recovery was defined as neck disability index  $\leq 4/50$  and global perceived effect  $\geq 4/5$ .

#### Results:

The majority of the cohort received EBC, including correct application of the Canadian C-spine rule (73%), and active treatments (e.g. 69% received exercise). However, the ability of primary HCPs to identify individuals at high risk of non-recovery and tailor management accordingly was poor (13% of high-risk correctly identified). Both risk level and the therapeutic relationship (OR 1.3 95%CI 1.1-1.6) were associated with recovery at 3 months.

#### Key Practice Points:

- Compliance with guideline-based content, such as providing active treatment has been implemented well in this cohort.
- However, process of care recommendations such as routine risk identification and matched care is not followed.
- Clinicians should identify risk and develop rapport with their patients for health outcomes to improve.

## HEALTH PRACTITIONERS' UNDERSTANDING OF CLINICAL PREDICTION RULES, AND THEIR PERCEPTIONS OF ADOPTING A NEW PROGNOSTIC WHIPLASH CLINICAL PREDICTION RULE

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MPA9A, Meeting Room C4.8, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

Explore health practitioners' understanding of clinical prediction rules, and investigate their perceptions of adopting a new prognostic whiplash clinical prediction rule

### Design:

Qualitative descriptive study

### Methods:

Six semi-structured focus groups were conducted in Sydney and Brisbane. Participants were recruited through purposive sampling and comprised physiotherapists (n = 19), chiropractors (n = 6) and osteopaths (n = 3) who provide routine treatment to people with whiplash associated disorders. Discussions were audio-recorded, transcribed verbatim and analysed using an inductive thematic approach.

### Results:

Participants considered components relating to acceptability ('whether I agree with it') and implementation ('how I would use it') when deciding whether or not to adopt a new clinical prediction rule. Acceptability was informed by four themes: knowledge and understanding, tool type, congruence and weighted value. Three themes were identified as having potential to enhance implementation of the whiplash clinical prediction rule: the presence of an external driver of adoption, flexibility in how it could be administered, and guidance regarding communication of results to patients.

### Conclusion:

- Education that enhances understanding of clinical prediction rule purpose and fit with practice may improve the whiplash clinical prediction rule's acceptability by assisting health practitioners' to recognise the potential merits of use.
- A whiplash clinical prediction rule impact-analysis study that incorporates situated learning opportunities for clinicians, an external source of motivation, administrative flexibility, and appropriate guidance to support communication of the tool's output is necessary to promote clinical adoption, whilst progressing the stage of development to one that supports more widespread implementation.

## IMPLEMENTATION OF GUIDELINES FOR WHIPLASH: AN AUDIT OF INSURER AND HEALTHCARE PROVIDER PRACTISE

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MPA9A, Meeting Room C4.8, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

Legislative change and guidelines for whiplash were introduced in NSW to improve early access to treatment and health outcomes. Subsequent implementation strategies targeted insurance companies and healthcare professionals. This study aims to investigate the extent to which insurers and health care professionals comply with recommendations and to explore factors related to adherence.

### Design:

Observational study involving an audit of insurance files.

#### Method:

A representative sample of 288 files from 4 insurance companies in NSW was reviewed. Data were extracted from the complete insurers file including claim notification forms, reports and correspondence from health care professionals. Analyses included descriptive statistics and correlation analysis.

#### Results:

Insurers approved timely access to treatment with GP consult occurring on average 4 days, and physical treatment 25 days after injury. A larger number of claimants received specialised imaging (49%), with insurers approving 36% of requests. Physical treatment was approved in 93% of claims, with majority of claimants having combined active and passive treatments. 59% of the claimants were referred to other specialists, with only 14% of these referrals being to whiplash specialists, and mostly occurring after recommended timeframes. Legal representation, and a longer claim time were associated with higher levels of medical visits and imaging ( $p$  0.21 to 0.3;  $p < 0.01$ ).

#### Conclusion/Key Practice Points:

- Good adherence with some guideline recommendations but evidence of unnecessary imaging, overuse of passive treatments, and underuse of whiplash specialists.
- These aspects of clinical management and insurer approval procedures should be targeted in future guideline revisions and implementation strategies.

#### THE PREVENT TRIAL: EXPLAINING PAIN FOR ACUTE LOW BACK PAIN. A RANDOMISED SHAM CONTROLLED TRIAL

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MPA9B, Meeting Room C4.1, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

Determine whether explaining pain can reduce pain intensity 12-weeks after a new episode of acute low back pain, compared to a sham intervention.

#### Design:

Randomised, sham-controlled trial with concealed allocation, assessor blinding and intention-to-treat analysis.

#### Methods:

We recruited participants from physiotherapy and general practice clinics in Sydney, Australia. To be eligible, participants had to have acute, non-specific low back pain (<4 weeks' duration) and be screened as at high-risk of poor outcome. We randomised participants to receive two, 1 hour sessions of Pain Education or Sham Education. For Pain Education, physiotherapists provided individualised education and advice adapted from the book Explain Pain. For Sham Education, physiotherapists used reflective listening and did not provide any education or advice. Linear mixed models tested the effect of the intervention on pain intensity over the past week (the primary outcome), measured on an 11-point scale, at 12-week follow-up.

#### Results:

We randomised 202 participants to the Pain Education (n=101) or Sham Education (n=101) groups. One hundred and ninety four out of 202 participants (96%) provided information for the primary outcome. There

was no between-group difference in pain-intensity at 12-weeks (Pain Education = 2.1 points, Sham Education = 2.4 points; mean difference 0.5 points, 95%CI -0.3 to 1.2).

Conclusion/ Key Practice Points:

- Explaining pain did not reduce pain-intensity compared to a sham intervention in patients with acute low back pain.
- Novel early intervention strategies are needed for patients with acute low back pain who are at high-risk of poor outcome.

Trial registration: ACTRN=1261200118080

ACUTE LOW BACK PAIN IS CHARACTERISED BY DIFFERENT SUBGROUPS WHO SHARE FEATURES OF PAIN SENSITIVITY AND CONDITIONED PAIN MODULATION

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MPA9B, Meeting Room C4.1, October 21, 2017, 10:35 AM - 11:35 AM

Aim:

This study aimed to: (i) compare pain measures (back [local] and forearm/thumb [remote]) between acute low back pain (LBP, <2 weeks onset) and pain-free individuals; (ii) compare pain measures between participants with “low” and “high” pain, (iii) identify subgroups with similar features, and (iv) evaluate potential contribution of demographic/behavioural/psychological factors to variation in measures.

Design:

Cross-sectional study

Method:

126 people with acute LBP (62M; 29(8) years) and 74 pain-free controls (29M; 27(7) years) participated. LBP participants were categorised as “high-pain” (VAS≥4) or “low-pain”. Participants completed questionnaires related to their sleep and psychological status. Pain thresholds to heat, cold and pressure were tested at the back and forearm/thumbnail. Conditioned pain modulation (CPM) was assessed with different test and conditioning stimuli arrangements using the back and forearm. Univariate ANOVAs/Kruskal-Wallis ANOVAs tested group differences. Potential subgroups were explored by principle component analysis and unbiased hierarchical clustering. Stepwise regression models investigated relationships between each sensory test with other factors.

Results:

LBP participants were more sensitive to heat and cold at both sites and pressure at the back. Only high-pain participants were more sensitive to heat at the forearm and cold/pressure at the back. CPM did not differ between groups. Hierarchical clustering revealed three subgroups: “low sensitivity/high CPM efficacy”; “high sensitivity”; and “low CPM efficiency”. Sensitivity was associated with poor sleep.

Conclusion/Key Practice Points:

- We demonstrate generalised hyperalgesia within two weeks of an acute LBP episode, but individual variation.
- Three subgroups were identified.
- Poor sleep was related to greater sensitivity.
- Specific sensory profiles might predict outcome.

## DEVELOPMENT OF A BACK AND NECK PAIN PATHWAY - PROOF OF CONCEPT TRIAL IN NEW SOUTH WALES, AUSTRALIA

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<sup>1</sup>*Royal North Shore Hospital, St Ives, Australia*

MPA9B, Meeting Room C4.1, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

To develop a pathway to manage patients presenting to Royal North Shore Hospital with back or neck pain using evidence based practice.

### Design:

A collaboration of the executive of the Royal North Shore Hospital, the Local Health District and the Agency for Clinical Innovation enabled the development of a management pathway.

### Method:

A steering committee designed a pathway to address rapid access from the emergency department to a rheumatology back clinic, spinal surgery clinic or physiotherapy service. A triage physiotherapist was utilised to decrease the long waiting time for patients to access a surgical opinion, on referral by their general practitioner.

### Results:

Increased patient numbers attending a rheumatology back pain clinic and those accessing physiotherapy services in the emergency department is demonstrated. Analysis of the descriptive statistics demonstrate that the triage physiotherapy process decreased the average waiting time for patients to access the orthopaedic spinal clinic from 381 days in January 2016 to 65 days in March 2017. Of the 644 patients triaged, 296 (46%) were offered a physiotherapy assessment. Of the 211 patients that attended the physiotherapy assessment, 152 were managed conservatively without a surgical opinion, 59 were offered a surgical opinion and seven (3.3%) patients were offered surgery.

### Conclusion/Key Practice Points:

- A clear pathway to manage patients with back and neck pain has demonstrated improvement in patient access to appropriate services.
- The extension of this model of service could be considered by other local state health authorities.

## BEYOND THE IMMEDIATE EFFECTS: DOES QUANTITATIVE SENSORY TESTING HAVE RELEVANCE TO CLINICAL PRACTICE?

**Bialosky J<sup>1</sup>**

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MPA9B, Meeting Room C4.1, October 21, 2017, 10:35 AM - 11:35 AM

Pain is a multidimensional construct poorly related to anatomical abnormalities. Psychological factors are suggested to account for this inconsistency; however, psychological factors explain a small amount of variance in the pain experience as well. Individual pain sensitivity may provide greater insight into the pain experience beyond anatomical and psychological factors. Quantitative sensory testing provides psychophysical assessment of pain sensitivity. Multiple rehabilitation interventions including manual therapy, transcutaneous electrical neuromuscular stimulation, and exercise are known to lessen pain sensitivity; however, these findings are often transient and their relationship to clinical outcomes is not firmly established. This presentation will focus on quantitative sensory testing and its theoretical role as both a prognostic indicator of treatment success as well as in characterizing subgroups of patients with chronic pain with the potential for driving mechanistic based approaches to prescribing rehabilitation interventions. Specifically, this presentation will describe different types of quantitative sensory testing including static measures such as pain thresholds and dynamic measures such as temporal summation and conditioned pain modulation.

### Key Practice Points: Participants will obtain insight into

- Different measures of pain sensitivity,
- Their relationship to clinical outcomes and the potential for their use in clinical practice.

## PREDICTORS OF HIGH LEVELS OF PATIENT-REPORTED ADHERENCE TO PHYSIOTHERAPIST-PRESCRIBED SELF-MANAGEMENT STRATEGIES

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MPA9C, Meeting Room C4.10, October 21, 2017, 10:35 AM - 11:35 AM

### Aims:

To explore the level of patient-reported adherence to physiotherapist-prescribed self-management strategies in private practice, and the extent to which patient, physiotherapist, consultation and prescription characteristics are associated with high levels of adherence to prescribed strategies.

### Design:

Cross-sectional observational study of 14 physiotherapists from four private practices involving a consecutive sample of 113 patients.

### Method:

Data were collected in two stages. Stage one: research physiotherapist observed one physiotherapist-patient consultation per participating patient to collect data related to physiotherapist prescription of self-management strategies. Stage two: follow-up telephone interview with each patient within 10-14 days of the observed consultation to record the patient-reported level of adherence to each prescribed strategy.

### Results:

Prescribed strategies where physiotherapists were observed to ask patients to repeat the details of the self-management plan, were 6.54 times (95% CI 2.91-14.98) more likely to be highly adhered to than strategies where the physiotherapist did not do this. In addition, prescribed strategies which were accompanied by printed information were 2.73 times (95% CI 1.24-6.00) more likely to be highly adhered to than strategies which were not. Conversely, advice (0.18 times: 95% CI 0.08-0.40) and other self-management strategies (0.30 times: 95% CI 0.12-0.78) were less likely to be highly adhered to when compared to home-based exercise programs.

### Conclusion/ Key Practice Points:

- High levels of adherence are associated with asking the patient to repeat the specifics of the self-management strategy and supplementing with printed information.
- Patients are more likely to adhere to exercise compared with advice and other prescribed strategies.

## THE EFFECTIVENESS OF USING AN APP WITH REMOTE SUPPORT TO IMPROVE ADHERENCE TO HOME EXERCISE PROGRAMS: A RANDOMISED CONTROLLED TRIAL

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MPA9C, Meeting Room C4.10, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

To determine if people given individualised home exercise programs on an App ([www.physiotherapyexercises.com](http://www.physiotherapyexercises.com)) with remote support are more likely to adhere to their exercise programs than if provided with paper handouts.

### Design:

Randomised, parallel-group trial with concealed allocation, assessor blinding and intention-to-treat analysis.

### Methods:

80 participants were randomised to receive their home exercise program via either the current paper-based method alone, or via our App with supplementary phone calls and motivational SMS. The primary outcome was self-reported exercise adherence 4 weeks after randomisation. The secondary outcomes included functional status, degree of disability, perceptions of treatment effectiveness, satisfaction with healthcare service delivery and assessor-reported exercise adherence.

#### Results:

Three participants were lost to follow up. The mean between-group difference for self-reported exercise adherence at 4 weeks was 1.3/11 points (95% CI, 0.2 to 2.3) favouring the intervention group. The mean between-group difference for the patient-specific functional scale was 0.9/11 points (95% CI, 0.3 to 1.7). There were no significant between-group differences for the remaining outcomes.

#### Conclusion/ Key Practice Points:

- Providing home exercise programs on an App in combination with remote support increases adherence and function compared to paper handouts for people with musculoskeletal conditions but the clinical importance of these increases are unclear
- There is scope for further research about the potential benefits of Apps for encouraging adherence to home exercise programs.

#### PATIENT PARTICIPATION DURING EXERCISE THERAPY IN MUSCULOSKELETAL PHYSIOTHERAPY: HOW PATIENTS ENGAGE AS RECEIVERS, PERFORMERS, CONTRIBUTORS AND COLLABORATORS

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MPA9C, Meeting Room C4.10, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

Communication in physiotherapy has shown to be essential for positive treatment outcomes. Yet, evidence exists that patient-physiotherapist interactions are often more practitioner-oriented rather than patient-centered. During exercise therapy, patients are required to learn exercises and be able to perform them independently. The study's objective was to analyze patient-therapist interactions during exercise therapy and analyze verbal and non-verbal resources used for patient participation.

#### Design:

A qualitative observational study was conducted.

#### Methods:

Data were collected from two clinical settings in Hong Kong. A total of 47 consultations involving six volunteer physiotherapists and sixteen patients were video-recorded. For data analysis, Conversation Analysis was adopted to examine the sequence and function of verbal and non-verbal aspects of communication.

#### Results:

Patients contributed during exercise therapy by expressing symptoms-related concerns, displaying (in) competence, seeking confirmation/clarification, and requesting or providing additional information. Yet, physiotherapists did not always acknowledge nor take subsequent actions in response to patients' initiatives. Four interactional strategies were identified based on patients' orientation during exercises: patients as receivers, performers, minor or major contributors and collaborators.

#### Conclusion/Key Practice Points:

- Multiple interactional resources and strategies are available for patients to participate actively during exercise therapy.
- Insufficient or excessive patient participation can impede the learning of an exercise.
- Patients as "major contributors" represent effective means to actively change the subsequent course of action.
- Even using a small sample, describing the fine details of patient-therapist interactions helps understand how language and bodily resources can be used for effective communication and collaboration during exercise therapy.

## PATIENT BELIEFS AND PERCEPTIONS ABOUT EXERCISE FOR NON-SPECIFIC CHRONIC LOW BACK PAIN: A SYSTEMATIC REVIEW OF QUALITATIVE RESEARCH

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MPA9C, Meeting Room C4.10, October 21, 2017, 10:35 AM - 11:35 AM

### Background:

The global burden of low back pain is the highest ranked condition contributing the years of living with disability and exercise is an effective treatment. Clinical practice guidelines recommend consideration of patient preferences and individualized exercise. It is likely that adherence and engagement will improve if programs align with participant preferences.

### Aim:

To identify and synthesize qualitative empirical studies that explored what people with non-specific chronic low back pain believe about exercise

### Design:

We conducted a systematic review, and meta-synthesis, of qualitative research that was informed by Cochrane and PRISMA Guidelines.

### Methods:

Pairs of independent reviewers used a priori eligibility criteria to select studies, extract data, appraise quality, conduct thematic analysis and synthesize in narrative format.

### Results:

From a yield of 3431 titles, 15 studies were included. Four key themes were identified: 1) Perceptions and classification of exercise; 2) Role and impact of the health professional; 3) Exercise and activity enablers/facilitators; 4) Exercise and activity barriers. Factors to consider in exercise program design include: preferred settings, exercise experience, levels of acquired skill and abilities. Care-seekers perceive that when exercise interferes with everyday life, is ineffective or too difficult to implement they will discontinue.

### Conclusions/Key Practice Points:

- People are likely to in exercise programs that are designed with consideration of their preferences, circumstances, fitness levels and exercise experiences.
- Consideration must be given to factors that facilitate engagement in exercise and to identify and remove barriers.
- Experiential knowledge may inform and engage exercise participants.

## ELASTIC ATHLETIC TAPE PROVIDES NO SHORT TERM BENEFIT OVER SHAM TAPE IN ADDITION TO EXERCISE IN PATIENTS WITH KNEE OSTEOARTHRITIS

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MPA9D, Meeting Room C4.6, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

To determine if differences exist between elastic athletic tape and sham taping in regards to pain and function over a six-week period in participants with knee osteoarthritis.

### Design:

Randomised placebo-controlled double blind trial.

#### Method:

Thirty-six participants were randomised to one of two groups,: 1) Intervention – taping with elastic athletic tape 2) Control - sham tape with Hypafix. The most painful knee was taped weekly for three weeks. All participants received exercise programs prescribed by an experienced physiotherapist.

#### Outcome measures:

Outcomes were assessed at baseline, one, three and six weeks. The primary outcome measure was change in pain on rest and movement (measured by visual analogue scales). Secondary outcome measures included a change in the Knee Osteoarthritis and Injury Score (KOOS). Differences between groups at each time period were examined using independent samples t-tests and mixed linear regression models. P value <0.05 was considered significant.

#### Results:

No difference between the two groups in pain at rest or with movement from baseline to six weeks was found, [rest: intervention 1.02 (SD 2.01) control 1.23 (SD 2.29) p value 0.79; movement: intervention 2.01 (3.41) control 2.72 (SD 2.49) p value 0.51]. Additionally, no difference between the groups in any of the KOOS domains was seen. Only the KOOS functional domain showed a clinically significant change from baseline to six weeks across the entire cohort [mean 10.66 (SD 15.83)].

#### Conclusion:

- Elastic athletic tape does not show any short-term benefit over sham taping (when combined with exercise) in pain or function in patients with knee osteoarthritis.

### GENERAL PRACTITIONERS' ENGAGEMENT WITH ALLIED HEALTH SERVICES FOR PRIMARY CARE MANAGEMENT OF KNEE OSTEOARTHRITIS: A QUALITATIVE STUDY

**Egerton T<sup>1</sup>**, Nelligan R<sup>1</sup>, Setchell J<sup>2</sup>, Atkins L<sup>3</sup>, Bennell K<sup>1</sup>

<sup>1</sup>NHMRC Centre of Research Excellence in Translational Research in Musculoskeletal Pain, Centre for Health, Exercise & Sports Medicine, The University of Melbourne, Parkville, Australia, <sup>2</sup>School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, Australia, <sup>3</sup>University College London, , London, United Kingdom

MPA9D, Meeting Room C4.6, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

To identify potential factors influencing GPs' engagement with a new service designed to provide evidence-based, non-drug, non-surgical treatments for patients with knee osteoarthritis (OA).

#### Design:

Qualitative study

#### Method:

Semi-structured telephone interviews with 11 GPs were conducted. Interview questions were designed to elicit their impressions of a service staffed by allied health professionals to support behaviour change and self-management for patients with knee OA, with a focus on exercise and weight loss. Transcripts were analysed using an inductive thematic approach, where GPs' opinions were organised using the APEASE (affordability, practicability, effectiveness, acceptability, safety/side effects and equity) criteria as themes. Ethical approval was granted by the school HREC (ID 1545504).

#### Results:

GPs expressed concerns about the potential for confusion about their treatment, incongruence of information and advice, disconnect with other initiatives, losing control of patient care, lack of belief in the need and benefits of services to deliver non-drug non-surgical treatments, resistance to change because of lack of familiarity with procedures, and reluctance to trust in the skills and abilities of the health professionals providing the care support. Most but not all GPs recognised the potential benefits for patients of having extra support.

Conclusion/Key Practice Points:

- Since people with chronic knee pain typically first present to GPs, how GPs view allied health services that support lifestyle treatments for people with knee OA has implications for physiotherapists in public and private settings.

Trial Registration: PROSPERO CRD42015027543

Funding: NHMRC CRE Translational Research in Musculoskeletal Pain

**"MY KNEE IS BUGGERED AND NEEDS REPLACING:" THE PERCEPTIONS OF PEOPLE WITH SEVERE KNEE OSTEOARTHRITIS FOLLOWING A WALKING PROGRAM**

**Wallis J<sup>1,2</sup>**, Webster K<sup>1</sup>, Levinger P<sup>3</sup>, Fong C<sup>2,4</sup>, Singh P<sup>2,4</sup>, Taylor N<sup>1,2</sup>

<sup>1</sup>La Trobe University, Bundoora, Australia, <sup>2</sup>Eastern Health, Box Hill, Australia, <sup>3</sup>Victoria University, Footscray, Australia, <sup>4</sup>Monash University, Clayton, Australia

MPA9D, Meeting Room C4.6, October 21, 2017, 10:35 AM - 11:35 AM

Aim:

Lack of physical activity for people with knee osteoarthritis is important due to their increased cardiovascular risk. Therefore the aim was to explore the perceptions of people with severe knee osteoarthritis with increased cardiovascular risk about participating in a walking program.

Design:

Qualitative study using semi-structured interviews.

Method:

Twenty-one participants with severe knee osteoarthritis who were prescribed a 12-week, moderate intensity walking program of 70 minutes per week, were interviewed after the completion of the program. Interviews were audiotaped, transcribed verbatim, member checked, coded and themes developed using thematic analysis. Findings were triangulated with quantitative data.

Results:

The main theme identified was the preoccupation with the knee including pain, damage and the view that surgery was required. Three subthemes to emerge were perceptions (1) of functional and psychosocial benefits from walking; (2) that supervision, monitoring and commitment were important enablers; and (3) that external factors such as ill health, weather and the environment were key barriers. The perceived functional benefits converged with results from quantitative data.

Conclusion/Key Practice Points:

- Even when patients with severe osteoarthritis of the knee report functional and psychosocial benefits from participating in a walking program, the core theme to emerge was their preoccupation with knee pain, knee damage and the view that they needed a knee replacement.
- The core theme highlights the difficulty implementing a walking program with patients with severe knee osteoarthritis.

**A WALKING PROGRAM FOR PEOPLE WITH SEVERE KNEE OSTEOARTHRITIS DID NOT REDUCE PAIN BUT MAY HAVE BENEFITS FOR CARDIOVASCULAR HEALTH**

**Wallis J<sup>1,2</sup>**, Webster K<sup>1</sup>, Levinger P<sup>3</sup>, Fong C<sup>2,4</sup>, Singh P<sup>2,4</sup>, Taylor N<sup>1,2</sup>

<sup>1</sup>La Trobe University, Bundoora, Australia, <sup>2</sup>Eastern Health, Box Hill, Australia, <sup>3</sup>Victoria University, Footscray, Australia, <sup>4</sup>Monash University, Clayton, Australia

MPA9D, Meeting Room C4.6, October 21, 2017, 10:35 AM - 11:35 AM

Aim:

The primary aim evaluated the effect of a walking program on knee pain for patients with severe knee osteoarthritis. Secondary aims evaluated the effects on cardiovascular health and function.

Design:

Phase II randomised controlled trial.

#### Method:

Forty-six participants (23 each group) with severe knee osteoarthritis and increased cardiovascular risk were randomly assigned to a 12-week, moderate intensity walking program of 70 mins/week or to usual care. The primary outcome was knee pain (0-10). Secondary outcomes were of cardiovascular risk including physical activity, blood pressure, blood lipid and glucose levels, body mass index and waist circumference; WOMAC and physical function.

#### Results:

Intention-to-treat analysis showed no between-group difference in knee pain. The walking group had increased odds of achieving a healthy systolic blood pressure (OR = 5.7, 95% CI 1.2 to 26.9), and a faster walking speed (MD = 0.12 m/s, 95% CI 0.02 to 0.23). Per protocol analysis based on participant adherence showed the walking group had more daily steps (MD = 1345 steps, 95% CI 365 to 2325); more time walking (MD = 18 mins/day, 95% CI 5 to 31); reduced waist circumference (MD = -5.3 cm, 95% CI -10.5 to -0.03); and increased knee stiffness (MD = 0.9 units, 95% CI 0.07 to 1.8).

#### Conclusion/Key Practice Points:

- A 12-week walking program did not reduce knee pain for people with severe knee osteoarthritis.
- Seventy minutes of moderate intensity walking per week for 12 weeks may be sufficient to make meaningful differences to cardiovascular health and function.

#### BREAKING UP SITTING TIME AFTER STROKE IMPROVES BLOOD PRESSURE (BUST-STROKE)

**English C**<sup>1,2</sup>, Janssen H<sup>1,2,3</sup>, Gary C<sup>1,2</sup>, Walker F<sup>1,2</sup>, Patterson A<sup>1</sup>, Callister R<sup>1</sup>, Dunn A<sup>1</sup>, Spratt N<sup>1</sup>, Ong L<sup>1</sup>, Oldmeadow C<sup>1</sup>, Palizzi K<sup>1</sup>, Dunstan D<sup>1,4</sup>, Bernhardt J<sup>2</sup>

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NNG/GPA9B, Meeting Room C4.9, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

Regular activity breaks have a significant positive effect on glucose metabolism and blood pressure in healthy, overweight and Type II diabetes populations. We examined metabolic and cardiovascular effects of breaking up prolonged, uninterrupted sitting with intermittent activity breaks in people with stroke.

#### Design:

Randomised within-participant crossover trial. We included people between 3 months and 10 years post-stroke, ambulant with minimal assistance and not taking diabetic medication other than metformin.

#### Method:

The 3 experimental conditions were: uninterrupted sitting (8 hours), sitting + half-hourly active standing breaks or sitting + half-hourly walking breaks. Bloods and blood pressure measures were collected half- to one-hourly. Primary outcome measure was post-prandial blood glucose. Secondary outcome measures included insulin levels and blood pressure. We used linear mixed modelling to examine between condition differences in outcomes.

#### Results:

19 participants (9 female, mean age 68.2 [10.2]) completed the trial. Thirteen (68%) had mild or no stroke symptoms, n=5 (26%) had diabetes. Average walking speed was 0.94 [0.48] m/s, range 0.12 to 1.65). Regular standing breaks significantly reduced systolic blood pressure (mean sitting 125 [16.4], standing 121 [12.1], walking 125 [14.4] mmHg, p=0.001). Analyses of glucose and insulin data are almost complete.

Conclusion / key practice points:

- Regular activity breaks using standing exercises may be a promising non-pharmacological intervention to target hypertension and recurrent stroke risk.
- The biological mechanisms by which regular standing breaks affect blood pressure control, as well as the relationship between sitting time, physical activity and blood pressure in free-living conditions requires further exploration.

## IMPLEMENTATION OF SAFE AND SUSTAINABLE COMMUNITY EXERCISE PROGRAMS FOR PEOPLE AFTER STROKE

**Bird M<sup>1</sup>**, Mortenson W<sup>1</sup>, Chu F, Accera N<sup>2</sup>, Yao J<sup>2</sup>, Hayley K, Eng J<sup>1</sup>

<sup>1</sup>University of British Columbia, Vancouver, Canada, <sup>2</sup>Vancouver Coastal Health, Vancouver, Canada

NNG/GPA9B, Meeting Room C4.9, October 21, 2017, 10:35 AM - 11:35 AM

Aim:

To develop an implementation framework to improve participation in exercise for people after stroke.

Design:

Stakeholder focus groups and interviews

Method:

Using an Integrated Knowledge Translation approach, between 5 and 15 people from each stakeholder group (people after stroke and their carers; health service clinicians; community centres and stroke support organisations; exercise professionals) were recruited under the direction of a representational advisory committee. In the first of two rounds of focus groups, participants provided perspectives on the type of exercise needed, referral pathways into the program and implementation factors to optimise adoption commitment. These focus groups were recorded, transcribed and thematically analysed, informing the development of a framework for consultation in the second round of focus groups.

Results:

Forty-two people provided informed consent. Pragmatic information about components of the exercise intervention (e.g., dose and delivery) were categorized as program, people and processes. Two pathways to the program - accessed straight from rehabilitation or self-referred from the community were identified. Thematic analysis identified a strong sense of belonging as driving participation in stroke-specific classes. The capacity for the community sector to offer a continuing service was seen as addressing issues with medical services availability.

Conclusion/ Key Practice Points:

- These study data support the need for the implementation of stroke-specific exercise classes in community centres
- Multiple referral pathways will meet people's needs immediately post-rehabilitation and for physical health management in the longer term
- Research that includes stakeholder input at the inception and during the research process informs successful implementation research.

## ACTIVE INGREDIENTS OF VIRTUAL REALITY INTERVENTIONS FOR LOWER EXTREMITY FUNCTION, BALANCE, MOBILITY, AND GAIT IN ADULTS POST-STROKE: A SCOPING REVIEW

**Lange B<sup>1</sup>**, Klotzbach L<sup>1</sup>, Koh J<sup>1</sup>, Hafner C<sup>1</sup>

<sup>1</sup>School of Health Sciences, Flinders University, Daw Park, Australia

NNG/GPA9B, Meeting Room C4.9, October 21, 2017, 10:35 AM - 11:35 AM

Aim:

To examine how motor learning principles are incorporated in Virtual Reality (VR) interventions to promote neuroplasticity in the rehabilitation of lower extremity function, balance, mobility, and gait for adults post-stroke.

**Design:**

A scoping review of papers evaluating the use of VR (2006–2016) was undertaken to explore the active ingredients and motor learning principles related to the use of VR following stroke.

**Method:**

The Joanna Briggs Institute methodology was used to search Medline, CINAHL, Scopus, and Cochrane databases using key terms covering the two core concepts of stroke and VR.

**Results:**

Thirty-eight studies met the criteria of use of VR with active participation of the lower limb to improve gait, mobility and balance outcomes. Twenty studies discussed specific motor learning principles of VR such as feedback, intensity, interactive environment, repetitions, and meaningfulness of task. Nine studies discussed general theories behind VR. Eight did not link active ingredients with outcomes. Only two studies objectively measured neuroplastic changes following VR intervention. The remaining studies measured only functional outcomes such as static and dynamic balance, gait speed, and symmetry.

**Conclusion/Key Practice Points:**

- The active ingredients identified in this scoping review were dosage, repetition, feedback, motivation, customisation to the user, and transfer of VR skills to real-world tasks.
- Visual feedback is the predominate feature of VR interventions for optimising the motor relearning process and facilitating neuroplasticity.
- Future research should focus on further identifying and evaluating specific features of VR that add benefit to traditional task-specific practice.

## WHAT IS CURRENT PRACTICE FOR UPPER LIMB REHABILITATION IN THE ACUTE HOSPITAL SETTING FOLLOWING STROKE?

**Serrada I<sup>1</sup>**, Hillier S<sup>1</sup>, McDonnell M<sup>1</sup>

<sup>1</sup>*University of South Australia, Adelaide, Australia*

NNG/GPA9B, Meeting Room C4.9, October 21, 2017, 10:35 AM - 11:35 AM

**Aim:**

To determine the current amount of therapy devoted to the upper limb and identify the types of interventions used.

**Design:**

Cross-sectional behavioural observational study.

**Method:**

Forty-six patients following stroke (mean 4.5days; SD6.0) and 15 therapists at five acute hospital sites in Australia and Italy were observed during Physiotherapy and Occupational Therapy sessions. Observation sessions were conducted within the first four weeks' post-stroke, over two days at each site, at least a week apart.

**Results:**

Across all observations, participants received a total median of 9.7minutes (IQR11.2) in Physiotherapy, and 18.0minutes in Occupational Therapy. Of this time, a median of 0.2minutes (IQR1.5) (2.1%) of Physiotherapy time and 3.3minutes (IQR4.4) (18.3%) of Occupational therapy addressed the upper limb. A narrow range of interventions were used with a strong focus on assessment rather than treatment. The amount of practice was influenced by therapist role, with Occupational Therapists providing more therapy time (Mann-Whitney U test,  $z=-2.487$ ,  $P=0.013$ ) but not a greater proportion of treatment. The Italian site devoted more time ( $\chi^2=14.048$ ,  $P=0.007$ ) to the upper limb, and a greater proportion was treatment ( $\chi^2=4.448$ ,  $P=0.035$ ). Neither severity of arm impairment, mobility restrictions or therapist experience influenced amount of time devoted to the upper limb, nor the proportion of treatment compared to assessment.

#### Conclusion/Key Practice Points

- In the observed stroke units, amount of time is low and the focus is on assessment.
- Amount of arm rehabilitation is not influenced by severity of arm impairments.
- Physiotherapists devoted less time on upper limb therapy than occupational therapists.

#### ACTIVITY PROMOTION FOR RECOVERY & PREVENTION

**Janssen H<sup>1</sup>**

<sup>1</sup>University of Newcastle, Newcastle, Australia

NNG9A, Meeting Room C4.7, October 21, 2017, 10:35 AM - 11:35 AM

Exposure to environments which facilitate sensorimotor, cognitive and social activity, 'enriched environments', in animal models has been shown to augment plasticity and functional performance including motor and cognitive function in: (i) healthy brain development, (ii) neurodegenerative brain disorders including Alzheimer's Disease and Parkinson's Disease and in that which will be the focus of this paper, (iii) acquired brain injury- specifically stroke. Current evidence for the use of environmental enrichment after stroke will be presented in conjunction with preliminary patient activity data from the control phase of the Phase II environmental enrichment Trial, AREISSA.

Sedentary behaviour, spending the majority of the day in sitting and or engaging in low levels of moderate to vigorous physical activity, is associated with greater risk of cardiovascular event and mortality. Stroke survivors are at even greater risk of having a recurrent cardiovascular event as compared to those of the same age who have not had a stroke event, they spend significantly more time sitting and less time engaged in the recommended levels of physical activity. Preliminary data from the projects (i) Breaking up Sitting Time after Stroke (BUST-Stroke) and (ii) Supporting Lifestyle and Activity Modification after TIA will be presented to illustrate the work underway to develop feasible interventions to promote less sitting and more movement so as to reduce recurrent stroke risk.

#### Conclusion/Key Practice Points:

- Evidence regarding the use of environmental enrichment in the clinical setting to inform activity promotion in attendee's clinical environment and evidence concerning the potential effect of breaking up sitting time in stroke survivors has on risk of recurrent stroke.

#### EMBEDDING AN ENRICHED ENVIRONMENT IN AN ACUTE STROKE UNIT INCREASES ACTIVITY IN PEOPLE WITH STROKE: A CONTROLLED BEFORE-AFTER PILOT STUDY

**Rosbergen I<sup>1,2</sup>**, Grimley R<sup>3</sup>, Hayward K<sup>1,4,5,6</sup>, Walker K<sup>2</sup>, Rowley D<sup>7</sup>, Campbell A<sup>2</sup>, McGuffic S<sup>2</sup>, Robertson S<sup>2</sup>, Trinder J<sup>7</sup>, Janssen H<sup>8</sup>, Brauer S<sup>1</sup>

<sup>1</sup>Division of Physical Therapy, School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, Australia, <sup>2</sup>Allied Health Medical Services, Sunshine Coast Hospital and Health Services, Birtinya, Australia, <sup>3</sup>Sunshine Coast Clinical School, The University of Queensland, Birtinya, Australia, <sup>4</sup>Department of Physical Therapy, University of British Columbia, Vancouver, Canada, <sup>5</sup>Stroke Division, Florey Institute of Neuroscience and Mental Health, Melbourne, Australia, <sup>6</sup>NHMRC Centre of Research Excellence, Stroke Rehabilitation and Brain Recovery, Melbourne, Australia, <sup>7</sup>Nursing and Midwifery, Sunshine Coast Hospital and Health Service, Birtinya, Australia, <sup>8</sup>Hunter Medical Research Institute, University of Newcastle, Newcastle, Australia

NNG9A, Meeting Room C4.7, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

To determine whether an enriched environment embedded in an acute stroke unit could increase activity levels in acute stroke patients and reduce adverse events.

#### Design:

Controlled before-after pilot study.

#### Method:

We recruited stroke patients admitted to an acute stroke unit during a) initial usual care control period, b) an enriched environment period and c) a sustainability period. Usual care participants received usual one-on-

one allied health and nursing interventions. The enriched environment participants were provided stimulating resources, communal areas for eating and socializing, and daily group activities. Change management strategies were used to implement an enriched environment within existing staffing levels. Behavioral mapping was used to estimate patient activity levels across groups. Participants were observed every 10 minutes between 7.30am and 7.30pm within the first 10 days after stroke. Adverse and serious adverse events were recorded using a clinical registry.

#### Results:

The enriched environment group (n=30, mean age 76.7±12.1) spent a significantly higher proportion of their day engaged in 'any' activity (71% vs. 58%, p = 0.005) compared to the usual care group (n=30, mean age 76.0±12.8). They were more active in physical (33% vs. 22%, p < 0.001), social (40% vs. 29%, p = 0.007) and cognitive domains (59% vs. 45%, p = 0.002) and changes were sustained 6 months post implementation. The enriched group experienced significant fewer adverse events (p = 0.001), with no differences found in serious adverse events (p = 0.31).

#### Conclusion:

Embedding an enriched environment in an acute stroke unit increased activity in stroke patients.

### HOW PHYSICALLY ACTIVE ARE PEOPLE FOLLOWING STROKE?

**Fini N<sup>1,2,3</sup>**, Bernhardt J<sup>2,4</sup>, Keating J<sup>5</sup>, Simek J<sup>5,6</sup>, Holland A<sup>1,2</sup>

<sup>1</sup>Physiotherapy Department, Alfred Health, Melbourne, Australia, <sup>2</sup>Physiotherapy Department, School of Allied Health, La Trobe University, Bundoora, Australia, <sup>3</sup>Physiotherapy Department, Melbourne School of Health Sciences, The University of Melbourne, Melbourne, Australia, <sup>4</sup>Florey Institute of Neurosciences and Mental Health, The University of Melbourne, Melbourne, Australia, <sup>5</sup>Physiotherapy Department, Monash University, Frankston, Australia, <sup>6</sup>Physiotherapy Department, Eastern Health, Melbourne, Australia

NNG9A, Meeting Room C4.7, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

Mobility limitations are common following stroke and frequently lead to poor participation in physical activity. The aim of this review was to describe physical activity across the various stages following stroke (acute, subacute and longer term).

#### Design:

Systematic review and quantitative synthesis.

#### Methods:

Searches were conducted in five databases. Eligible studies included participants with stroke whose physical activity was quantitatively measured for at least four hours in a single session. Two reviewers independently reviewed titles and abstracts. Quality was assessed using the Downs and Black checklist. Weighted means were calculated for physical activity outcomes.

#### Results:

Searches yielded 103 eligible papers including 5306 participants aged 21 to 96 years. Devices (e.g. activity monitors) were used in 73 papers and behavioural mapping in 30. Devices show that people with stroke took on average 5535 steps per day (n=406, range: 783-7400) in the subacute phase and 4074 steps (n=1097, range: 1389-8422) in the longer term. Average daily walking duration was higher in the longer term (9.0%, n=100) than subacute (1.8%, n=172) and sedentary time was >78% regardless of time post stroke. Behavioural mapping showed time in bed was higher in the acute than subacute phase (mean 45.1% versus 23.8%), with similar time spent sitting (mean 37.6% versus 32.6%).

#### Conclusion/Key Practice Points:

- Physical activity levels do not meet guidelines following stroke.
- Time spent inactive and sedentary is high at all times.
- Increasing physical activity and developing standardised activity targets may be important across all stages of stroke recovery.

## PARTNERSHIP AND INNOVATION - GOOD PRACTICE IN EARLY CHILDHOOD INTERVENTION IN AN NDIS CONTEXT

**De Natris P, Luscombe D, Kohlenberg C,**

NPG9, Meeting Room C4.11, October 21, 2017, 10:35 AM - 11:35 AM

This panel session will explore the funding and provision of supports to children in a National Disability Insurance Scheme (NDIS) environment. It will highlight what is considered best practice in physiotherapy supports for children with disabilities and help participants understand the work that Early Childhood Intervention Australia and the APA have done, and are doing in this space.

## THE ROLE OF PHYSIOTHERAPY IN FUTURE MODELS OF CARE FOR INJURED WORKERS

**Beales D<sup>1</sup>**

<sup>1</sup>*Curtin University, Australia*

OHP9, Meeting Room C3.3, October 21, 2017, 10:35 AM - 11:35 AM

### Outline:

Physiotherapists are a key participant in the management of injured workers. Managing injured workers, particularly in the compensation environment, presents unique challenges beyond those encountered in non-compensable clients. This includes additional layers of risk factors for poor outcome that can influence the therapeutic intent of physiotherapy management. Also, management takes place in a complicated environment with many different stakeholders, sometimes challenging a unified approach.

Models of care for the management of injured workers are evolving. A recent review has provided thought on an integrated model of care for workers with musculoskeletal pain in a compensation environment. From this emerges helpful and unhelpful perspectives and behaviours that may influence the context for an injured worker in positive or negative manners. These perspectives and behaviours occur at a systems level, organisational level, and certainly at an individual level. As models of care for injured workers continue to evolve, the physiotherapy profession and individual practitioners need to consider their roles within these models of care. Where are the opportunities? What are the threats? How do physiotherapy and physiotherapists maintain, or even enhance, their effectiveness and worth in this environment?

One key overarching principle of future models of care in the compensation environment is understanding the biopsychosocial nature of work injuries coupled with a contemporary understanding of pain biology. Another is understanding that work is integral to good health; work is therapeutic. How do physiotherapists practice and behaviours align to these overarching principles?

### Key Practice Points:

- Participants will be guided to a practical way of reflecting on their own behaviours and skills, to help enhance their participation and value in the compensation arena.

## MUSCULOSKELETAL DISORDER PREVENTION IN A CONTEMPORARY WORKPLACE

**Grant R<sup>1</sup>**

<sup>1</sup>*Axis Rehabilitation at Work, Brisbane City, Australia*

OHP9, Meeting Room C3.3, October 21, 2017, 10:35 AM - 11:35 AM

### Background:

Occupational Health Physiotherapists (OHP) provide many services to workers and workplaces. Not only do employers actively seek to reduce the risk for injury but are keen to reduce the risk of minor complaints becoming a compensable injury. This presentation will share our experience collaborating with a large and vibrant organisation in the aviation industry to address the increasing rate of musculoskeletal disorders among their workforce.

**Aim:**

To illustrate the development and implementation of a comprehensive workplace-based intervention to prevent and manage musculoskeletal problems.

**Approach:**

This case study will illustrate the steps taken to comprehensively address the concerns of one organisation in the aviation industry. These included: 1) meet with senior leadership team to draft the scope of services and to build an effective and collaborative working relationship; 2) document the challenges facing the aviation industry and workers (e.g. competitive economy, environmental constraints); 3) provide a staged approach across the organisation of agreed services targeting primary, secondary and tertiary interventions. Most of this presentation will focus on the services implemented at each level of the prevention paradigm. Preliminary results presented will motivate and enhance confidence of the OHP working with industry.

**Key Practice Points:**

- OHPs can work effectively with industry to prevent and manage the risk for musculoskeletal problems
- Knowledge of different levels of injury prevention and how they can be applied in practice can help workers and employers
- Step-by-step guide for physiotherapists on how to approach and collaborate with workplaces to achieve a win-win solution.

**THE EFFECT OF ADDING A PHYSICAL ACTIVITY INTERVENTION TO PULMONARY REHABILITATION ON DAILY STEPS AND SEDENTARY TIME: A PILOT STUDY**

**Alam A<sup>1</sup>**, Wootton S<sup>1</sup>, McKeough Z<sup>2</sup>

<sup>1</sup>*Chronic Disease Community Rehabilitation Service, Northern Sydney Local Health District, NSW Health, North Ryde, Australia*, <sup>2</sup>*Discipline of Physiotherapy, University of Sydney, Lidcombe, Australia*

R5-9, Meeting Room C4.2, October 21, 2017, 10:35 AM - 11:35 AM

**Aim:**

To evaluate the effect of adding a physical activity intervention (pedometers and physical activity counselling) to pulmonary rehabilitation on daily steps and sedentary time in people with chronic respiratory disease.

**Design:**

Single arm, multi-site, prospective pilot study.

**Methods:**

Participants referred to pulmonary rehabilitation were recruited from five metropolitan sites. All participants completed pulmonary rehabilitation twice weekly for eight weeks. Daily step count was measured using a pedometer and sedentary time was measured by the sedentary behaviour questionnaire at baseline (week three of pulmonary rehabilitation) and follow up (week eight of pulmonary rehabilitation). Participants were instructed to wear a pedometer and record daily step counts for the five week intervention. Individualised step goals were discussed and agreed upon each week following a review of the previous weeks' step counts by the physiotherapist.

**Results:**

Fourteen participants (mean [SD] age 76 [10] years, 71% with COPD (FEV1 % predicted 68 [24])) agreed to participate in the study with 12 completing follow up assessment. Baseline steps per day were 4786 (2255) with average daily time spent in sedentary activities being 439 (137) minutes. There was a trend towards an improvement of 823 steps per day (95% CI -25 to 1671,  $p = 0.06$ ) and a non-significant reduction in sedentary time of 60 minutes per day (95% CI -136 to 15,  $p = 0.1$ ) following the intervention.

**Conclusion/Key Practice Point:**

- The improvement in daily steps from this pedometer-based intervention was within the minimum important difference range of 600 – 1100 steps per day.

## EFFECTS OF NON-PHARMACOLOGICAL INTERVENTIONS INCLUDING EXERCISE IN MANAGING FATIGUE IN CHRONIC KIDNEY DISEASE OR END-STAGE KIDNEY DISEASE

**Gibson A<sup>1</sup>**, McCann S<sup>1</sup>

<sup>1</sup>Northern Health, Epping, Australia

R5-9, Meeting Room C4.2, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

To determine if non-pharmacological interventions including, some of which included exercise were effective in managing fatigue in chronic kidney disease (CKD) or end-stage kidney disease (ESKD).

### Design:

A systematic review and meta-analysis.

### Method:

Six databases were searched from inception to October 2016. Randomised controlled trials, published in English that examined non-pharmacological interventions in CKD or ESKD were included. Trial quality was assessed using the PEDro scale. The GRADE approach was used to determine the quality of the evidence in the meta-analysis.

### Results:

14 studies were included in the systematic review and 11 in meta-analysis. The largest subgroup of interventions was exercise, with 5 studies included in the qualitative analysis. Other types of interventions included acupressure and reflexology, Cognitive Behavioural Therapy and a health education program. Overall meta-analysis of 11 studies found low quality evidence that non-pharmacological interventions were effective in managing fatigue in CKD or ESKD (SMD = -0.64; 95% CI, -0.94—0.34). Meta-analysis of 4 studies found very low quality evidence that exercise was effective for managing fatigue in CKD or ESKD (SMD = -0.77; 95% CI, -1.32—0.22).

### Conclusion/Key Practice Points:

- There was low quality evidence supporting the use of non-pharmacological interventions including exercise in managing fatigue in CKD or ESKD.
- Further studies of sound methodological quality are needed to confirm results.

## ACCELEROMETER MEASUREMENT OF PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR ONE YEAR AFTER UNILATERAL PRIMARY TOTAL KNEE REPLACEMENT: A CROSS-SECTIONAL PILOT STUDY

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R5-9, Meeting Room C4.2, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

To objectively measure current levels of physical activity and sedentary behaviour one year after total knee replacement; and to compare these to the recommended World Health Organisation guidelines of 150 minutes of moderate activity per week, and excessive sedentary behaviour (> six hours/day).

### Design:

Participants were aged >45 years and recruited from a private orthopaedic clinic 12 months after unilateral total knee replacement.

### Method:

Participants wore an activity monitor (wrist actigraph wGT3X-BT) during waking hours for four consecutive days. Participants also completed a suite of questionnaires to evaluate clinical factors likely to affect activity levels (including knee pain, comorbidities and motivation).

#### Results:

Our preliminary analysis of data from 30 participants (age range 54-90 years; 42% women) revealed that although 89% met the recommended activity level of 150 minutes per week, 89% of participants demonstrated excessive sedentary behaviour. Knee pain and comorbidities negatively correlated with activity levels.

#### Conclusion:

Most participants met the recommended guidelines for physical activity; however a majority of participants also displayed excessive sedentary behaviour one year after total knee replacement.

#### Key Practice Points:

- Rehabilitation programs should incorporate strategies to address excessive sedentary behaviour and maximize activity despite comorbidities.
- Physiotherapists are in a unique position to educate patients who have had a total knee replacement about the recommended activity guidelines and importance of minimizing sedentary behaviour.
- This study recruited a group of private patients (well-educated and motivated) and may not be representative of all patients following total knee replacement surgery.

### A COMPARISON OF ACTIVITY MONITOR DATA FROM DEVICES WORN ON THE WRIST AND THE WAIST IN PEOPLE WITH PARKINSON'S DISEASE

**Kim D<sup>1</sup>**, Nguy V<sup>1</sup>, Hassett L<sup>1</sup>, Allen N<sup>1</sup>

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R5-9, Meeting Room C4.2, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

To determine in people with Parkinson's disease: (i) if activity monitor data collected from devices worn at the wrist and the waist are comparable and (ii) the contribution of tremor to any differences.

#### Design:

Cross-sectional observational study.

#### Method:

Forty community-dwelling people with Parkinson's disease wore activity monitors Actigraph GT3X+ at the wrist and waist for one week. Average steps per day and percent time in sedentary, light and moderate/vigorous activity were extracted. A tremor score was calculated from the MDS-UPDRS.

#### Results:

Significantly higher values were recorded by the wrist monitor for average steps/day (9,343, (SD 3,991) vs 5,483 (SD 2,851),  $p < 0.001$ ), time in light activity (52% (SD 9%) vs 28% (SD 10%),  $p < 0.001$ ); and in moderate/vigorous activity (11% (SD 8%) vs 2% (SD 2%),  $p < 0.001$ ). In contrast, the waist recorded higher values for sedentary time (70% (SD 11%) vs 37% (SD 14%),  $p < 0.001$ ). However all measures were strongly correlated ( $r = 0.593$  to  $0.905$ ,  $p \leq 0.001$ ). The total tremor score significantly contributed to the difference between the wrist and the waist for average steps/day ( $B = 0.354$ ,  $p < 0.025$ ). However, the wrist and waist measures remained strongly correlated in participants with increased tremor ( $n = 22$ ,  $r = 0.924$ ,  $p < 0.001$ ).

#### Conclusion/Key Practice Points:

- People with Parkinson's disease, including those with tremors, can wear activity monitors on the wrist to monitor changes in activity, however devices at the wrist appear to overestimate physical activity and under-estimate sedentary time.

## EVALUATE THE CLINIMETRIC PROPERTIES OF PHYSICAL FITNESS ASSESSMENTS REPORTED FOR CHILDREN WITH CYSTIC FIBROSIS

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R5-9, Meeting Room C4.2, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

Evaluate the clinimetric properties of physical fitness assessments reported for children with Cystic Fibrosis.

### Method:

A systematic search of electronic databases (PubMed, Web of Science, Medline, and PEDro) was performed to identify assessments i) published in English after 1950, ii) that measure physical fitness, iii) in individuals with CF, iv) with psychometric data available. Psychometric evidence was evaluated using the COnsensus-based Standards for the selection of health Measurement Instruments (COSMIN) checklist.

### Results:

Searches identified 298 papers, of which 16 included psychometric data for eight exercise tests: 6MWT, 3MST, MST, 1-minute-sit-to-stand test (1MSTS) and cycle ergometer (ERGO). The 6MWT, 1MSTS and MST showed excellent test-retest reliability (ICC=0.94, 0.98, and 0.90 respectively) and good concurrent validity with ERGO and pulmonary function testing. Numerous ERGO protocols showed excellent reliability (ICC=0.91-0.95), good validation against peak oxygen intake (VO<sub>2</sub>max), and responsiveness to clinical interventions. No reliability data was available for the 3MST, but it is responsive to antibiotic treatment. The 1MST and MST were reported to elicit a higher heart rate and dyspnoea when compared to the 6MWT. The 3MST showed greater physiological response than the 6MWT but less than ERGO.

### Key Practice Points

- Psychometric data is lacking for physical fitness measures for CF.
- 6MWT demonstrates strong psychometrics and is the only assessment with predictive values to hospitalisation.
- Other measures may elicit a greater cardiovascular response and have better clinical utility for telehealth.
- More research is needed to establish psychometric data on exercise tests for children with CF.

## RELATIONSHIPS BETWEEN SEVERITY OF URINARY INCONTINENCE AND PHYSICAL ACTIVITY LEVELS IN PATIENTS WHO HAVE UNDERGONE AN EXERCISE PROGRAM FOLLOWING PROSTATECTOMY

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R5-9, Meeting Room C4.2, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

To determine whether pre-exercise program severity of urinary incontinence is a predictive factor for a change in physical activity levels following an exercise program.

### Design:

A subgroup analysis of data from patients who participated in a prospective observational study investigating the feasibility of an 8-week, twice weekly supervised exercise program for patients following surgery for abdomino-pelvic cancer.

### Method:

Data from 45 patients who were experiencing post-prostatectomy urinary incontinence and consented to participate in the exercise program were analysed. Physical activity levels were measured using the

International Physical Activity Questionnaire short form and severity of urinary incontinence was measured using the International Consultation on Incontinence Questionnaire - Urinary Incontinence Short Form at pre-intervention (10 weeks post-prostatectomy) and post-intervention (18 weeks post-prostatectomy). Multiple linear regression was used to assess the relationships between severity of urinary incontinence (independent variable) and physical activity levels (dependent variable).

#### Results:

The mean (standard deviation) urinary incontinence total score at pre- and post-intervention was 10.2 (4.5) and 6.0 (4.1), respectively, and the mean total physical activity levels were 1988.5 (2347.7) MET-mins/week at pre-intervention and 4768.1 (6072.1) MET-mins/week at post-intervention. After adjustment for age, body mass index and employment status, the pre-intervention severity of urinary incontinence was a significant predictor of change in total physical activity levels ( $\beta = 0.403$ ,  $p = 0.02$ ) following the exercise program.

#### Conclusion/Key Practice Points:

- Higher severity of urinary incontinence at pre-intervention (i.e. 10-weeks post-prostatectomy) was a significant predictor of improvement in physical activity levels following the exercise program.

### EFFICACY OF EXERCISE INTERVENTIONS ON WORK ABILITY FOR INDIVIDUALS WITH CHRONIC WHIPLASH-ASSOCIATED DISORDERS: A RANDOMIZED CONTROLLED TRIAL

**Lo H<sup>1</sup>**, Johnston V<sup>1</sup>, Ludvigsson M<sup>2,6</sup>, Peterson G<sup>2,3</sup>, Overmeer T<sup>4,5</sup>, Peolsson A<sup>2</sup>

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R5-9, Meeting Room C4.2, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

To determine the effect of three exercise interventions and factors associated with self-reported work ability for people with chronic whiplash associated disorder (WAD).

#### Design:

This was a secondary analysis of a randomized controlled trial with concealed allocation, assessor blinding and intention-to-treat analysis.

#### Method:

165 participants with chronic WAD grade II–III were randomly allocated to receive Neck-specific exercise with or without a behavioral approach (NSEB/NSE) or prescribed physical activity (PPA). Work ability was evaluated with the Work Ability Index (WAI) at baseline, three, six and twelve months. Individual, psychosocial, work-specific, condition-related and exercise variables were collected at baseline.

#### Results:

The NSEB intervention was significantly better in improving work ability than the PPA intervention (3 months,  $p=0.03$ ; 6 months,  $p=0.01$ ; 12 months,  $p=0.01$ ). The between-group difference for NSEB and NSE intervention was only significant at 12-months ( $p=0.01$ ), while no significant differences were observed between NSE and PPA intervention at any time point. Work ability significantly increased from baseline to one year by 7.58% for the NSEB group ( $p=0.004$ ). No significant change from baseline was observed for those receiving NSE/PPA. Regression modeling showed that physical demands at work, self-reported disability, depression and financial situation at baseline were significantly associated with the score on the WAI ( $p<0.01$ ).

#### Conclusions/ Key Practice Points:

- Three months of NSEB improved self-reported work ability after one year;
- Providing NSE alone or a PPA did not significantly improve work ability in the short or long-term.

Trial registration: NCT01528579

## STEP COUNT DURING HOSPITALISATION WITH COMMUNITY-ACQUIRED PNEUMONIA IS REDUCED IN THOSE WHO ARE OLDER OR THOSE WITH GREATER CLINICAL FRAILTY

**Rice H<sup>1,2</sup>**, Hill K<sup>1,2,3</sup>, Fowler R<sup>1,2</sup>, Watson C<sup>2</sup>, Waterer G<sup>2,4</sup>

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R5-9, Meeting Room C4.2, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

In adults hospitalised with community acquired pneumonia, to explore relationships between daily step count and possible influencing factors of; (i) age, (ii) severity of illness and, (iii) clinical frailty.

### Design:

A prospective observational study.

### Methods:

Adults hospitalised with community acquired pneumonia were identified using electronic databases. Throughout their admission, participants wore a StepWatch Activity Monitor. Details related to clinical management were recorded. For analyses, participants were grouped according to disease severity using CURB (scores of 0 and 1 = less severe disease and 2 and 3 = more severe disease) and clinical frailty scores (scores of 1 to 3 = mild frailty and 4 to 7 = moderate-to-severe frailty).

### Results:

Of the 31 participants recruited to the study, 16 wore the StepWatch for more than 24 hours. These participants were aged (mean±SD) 67±20 years and had a length of stay of (median [interquartile range]) 3 [2.25 to 6] days. Daily step count was (mean±SD) 902 [1186] steps and was negatively associated with age ( $r_s = -0.70$ ;  $p = 0.003$ ). Daily step count was similar in those with less severe versus more severe disease (846 [396] vs. 1564 [2199] steps;  $p = 0.39$ ). However, compared with those who had mild clinical frailty, those with moderate-to-severe clinical frailty took fewer daily steps (1382 [1486] vs 311 [613] steps;  $p = 0.001$ ).

### Conclusion/Key Practice Points:

- Greater age and clinical frailty were associated with lower daily step counts, suggesting that physiotherapy should target older and frailer patients admitted with pneumonia for mobilisation programs.

## IS PROGRESSIVE RESISTANCE TRAINING FEASIBLE AND SAFE FOR PEOPLE WITH PRADER WILLI SYNDROME? A PILOT RANDOMISED CONTROLLED TRIAL

**Shields N<sup>1,2</sup>**, Taylor N<sup>1,3</sup>, Bennell K<sup>4</sup>

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R5-9, Meeting Room C4.2, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

To investigate the feasibility and safety of progressive resistance training for people with Prader Willi syndrome.

### Design:

Single-blind randomised controlled trial with concealed allocation, assessor blinding and intention to treat analysis.

### Method:

16 participants (8 female; mean age 25.8 years) were recruited. The experimental group ( $n = 8$ ) completed 10 weeks of progressive resistance training at a community gym supervised by a physiotherapist. The program comprised seven exercises using pin-loaded machines. The waitlist control group ( $n = 8$ ) continued with usual activities.

#### Outcome measures:

Muscle strength (1 repetition maximum chest press and leg press) and muscle performance (weighted box stacking) were assessed at baseline and week 11. Data were also collected on safety, attendance, and adherence. Data were analysed using ANCOVA and standardised mean differences were calculated for change scores.

#### Results:

Participants attended 92% of sessions with no adverse events. The experimental group progressed the resistance during training by 82% (range 60–140%). There was no difference between the groups for arm strength (mean difference 3 kg, 95%CI -1 to 7; standardised mean differences 0.8, 95%CI -0.2 to 1.8), leg strength (mean difference 13 kg, 95%CI -6 to 32; standardised mean differences 0.78, 95%CI -0.27 to 1.83) or weighted box stacking (mean difference -1.2, 95%CI -3 to 1; standardised mean differences -0.49, 95%CI -1.52 to 0.54).

#### Conclusions/Key Practice Points:

- Preliminary evidence that progressive resistance training is feasible and safe for people with Prader Willi syndrome.

Trial registration: ACTRN12616000107426

## THE EFFECTIVENESS OF AQUATIC INTERVENTIONS IN THE DEVELOPMENT OF MOTOR SKILLS AND PHYSICAL FITNESS IN CHILDREN WITH AUTISM SPECTRUM DISORDERS.

### Taverna W<sup>1</sup>

<sup>1</sup>*Cobaw Community Health / Bendigo Health, Loddon Mallee Region, Australia*

R5-9, Meeting Room C4.2, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

To review the evidence for aquatic interventions in the development of motor skills and physical fitness in children with Autism Spectrum Disorders (ASDs).

#### Design:

Literature review.

#### Methods:

Databases including the Cochrane Library, CINAHL and Embase were searched for articles published after 2000. Studies of children with ASDs were included if they used outcome measures assessing: motor skills (including swimming) and physical fitness. Studies were critically appraised against The National Health and Medical Research Council (NHMRC) levels of evidence, PEDro scale and the Cochrane risk of bias tool.

#### Results:

14 studies from 2004 to 2015 were analysed. Five studies were rated as NHMRC level III and nine were rated as level IV. PEDro scores for case controlled and group comparison studies ranged from 3 to 5. ASD children aged 3-12 years made significant gains in water orientation and swimming skills when a Halliwick intervention approach was conducted twice weekly for at least 10 weeks. Children were able to learn in pairs with peers (ASD or typical developing) or siblings using varied teaching methods. Physical fitness measures typically showed improvements. The effect of aquatic intervention on motor performance and fitness components is inconclusive. Small study and participant numbers, poor methodological quality, and minimal statistical analysis limit interpretation.

#### Conclusion/Key Practice Points:

- Adopting a Halliwick approach led to significant aquatic skill development in children with ASD
- ASD children learn successfully in pairs with peers or siblings
- Minimum duration and frequency of intervention is twice weekly for 10 weeks.

## BONE-SPECIFIC PHYSICAL ACTIVITY QUESTIONNAIRE SCORES ARE ASSOCIATED WITH ESTIMATES OF CALCANEAL BONE QUALITY IN ADULTS ACROSS THE AGE SPAN

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R5-9, Meeting Room C4.2, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

To examine relationships between Bone-specific Physical Activity Questionnaire (BPAQ) scores and parameters of calcaneal bone quality in adults across the age span.

### Design:

Cross-sectional

### Method:

229 men and women (17-78 years) underwent calcaneal quantitative ultrasonometry (Lunar Achilles Insight, GE) to measure broadband ultrasound attenuation (BUA), speed of sound (SOS), and stiffness index (SI). Physical activity participation was recorded with the BPAQ to derive total BPAQ score and its sub-scores (current and past). Pearson correlation analyses were used to examine relationships between BPAQ and ultrasound parameters.

### Results:

For the whole group, total BPAQ score was associated with SOS ( $r = 0.19$ ,  $p = 0.01$ ) and SI ( $r = 0.17$ ,  $p = 0.01$ ). Current BPAQ score was related to BUA ( $r = 0.26$ ,  $p < 0.001$ ), SOS ( $r = 0.26$ ,  $p < 0.001$ ), and SI ( $r = 0.28$ ,  $p < 0.001$ ), while past BPAQ score was related to SOS ( $r = 0.17$ ,  $p = 0.01$ ) and SI ( $r = 0.16$ ,  $p = 0.02$ ). For sex-specific analyses, only women exhibited associations; current BPAQ score was positively associated with BUA ( $r = 0.27$ ,  $p = 0.001$ ), SOS ( $r = 0.37$ ,  $p < 0.001$ ), and SI ( $r = 0.34$ ,  $p < 0.001$ ), and total BPAQ score associated with SOS ( $r = 0.17$ ,  $p = 0.04$ ).

### Conclusion/Key Practice Points:

- BPAQ scores are associated with parameters of bone quality in healthy adults across life, particularly in women.
- Such relationships reinforce earlier findings of positive BPAQ associations with other indices of bone mass and strength.

## IMAGING IN SPORTS: A FRIEND OR FOE? EXPERT PANEL DISCUSSION

**Makdissi M, Delahunt E<sup>1</sup>, Pizzari T<sup>2</sup>, Lewis J<sup>3</sup>, Mayes S<sup>4</sup>**

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SPA9A, Darling Harbour Theatre, October 21, 2017, 10:35 AM - 11:35 AM

The use of imaging for the diagnosis of sports injuries is becoming commonplace, with the advent of new technology and improved access to imaging facilities. While this can provide valuable information to assist the clinician, its use may also result in over-diagnosis of injury. In addition, normal variants seen in the musculoskeletal system that occur with age and activity, can be reported as pathology, creating a perception that the injury requires intervention that may be expensive, invasive and costly. This panel discussion brings together international experts in the field of sports medicine, chaired by Dr Natalie Collins of the University of Queensland. The panel will discuss the use of imaging in fields as diverse as shoulder injury, hip injury, concussion, hamstring injury and ankle injury. The complexities of imaging use, when it is appropriate and not appropriate to image injured athletes, and the implications for management based on imaging findings will be discussed.

## CAN INTRINSIC FOOT MUSCLE SIZE BE RELIABLY MEASURED IN WEIGHT BEARING AND NON-WEIGHT BEARING USING ULTRASOUND IMAGING?

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SPA9B, Meeting Room C4.4, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

To establish reliability of ultrasound imaging to measure intrinsic foot muscle size in weight bearing (WB) and non-weight bearing (NWB).

### Design:

Observational repeated measures study

### Method:

Twenty-four healthy participants without lower limb pain (13 males; mean (standard deviation) age 31 (9) years, body mass index 24.8 (3.2) kg/m<sup>2</sup>) were imaged on two occasions, one week apart. Images were taken in sitting with minimal weight on the foot (NWB), and in bilateral stance (WB). Cross-sectional area and thickness of the abductor hallucis muscle, and thickness of the muscles of the first interstitium (adductor hallucis, first dorsal interosseous and lumbrical muscles) were measured from the images. A second operator also acquired images at the first session. Intra-class correlation coefficients (ICC) and standard error of measurement (SEM; expressed as % mean values) were calculated.

### Results:

For all measures, inter-rater reliability ICCs exceeded 0.82 and SEMs were less than 8.2%; within-session intra-rater reliability ICCs exceeded 0.92 and SEMs were less than 5.3%; and between-session intra-rater reliability ICCs exceeded 0.81 and SEMs were less than 6.5%.

### Conclusion/Key Practice Points:

- Measurements of intrinsic foot muscle size using ultrasound imaging in both NWB and WB demonstrated high reliability between operators and across one week
- These measurements could be used to monitor progress in conditions previously associated with intrinsic foot muscle atrophy such as hallux valgus, plantar fasciitis and diabetes
- NWB measurements allow evaluation in a relaxed state or for patients unable to bear weight, whereas WB measurements allow more functionally relevant evaluation.

## IN WHAT MOMENT IN A MATCH ARE ANKLE SPRAINS MORE LIKELY TO OCCUR? A SYSTEMATIC REVIEW WITH META-ANALYSIS

**de Noronha M<sup>1</sup>**, McPhee M<sup>1</sup>, Lay E<sup>1</sup>, Nunes G<sup>2</sup>, Mhartzaganian G<sup>1</sup>

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SPA9B, Meeting Room C4.4, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

To determine whether ankle sprains are more frequent in any particular moment during sport.

### Design:

Systematic review with meta-analysis

### Method:

The databases CINAHL, EMBASE, MEDLINE and SPORTDiscus were searched up to August 2016. The search targeted studies that presented data on the time of occurrence of ankle sprains during sports matches. Data from included studies were analysed as percentage of ankle sprain occurrence by half time and by quarters. Meta-analyses were run using a random effects model.

#### Results:

1703 studies were initially identified and 8 that met the inclusion/exclusion criteria were included. Sports included were soccer (3), rugby (2), futsal (1), American football (1), and Gaelic football (1). Meta-analyses included 500 ankle sprains. There was no difference in pooled percentages of ankle sprain occurrence between first and second halves of a match (44% vs 56%  $p = 0.2$ ). However for the analysis by quarters, fewer sprains occurred in first quarter (14%, 95% CI 9% to 19%) when compared to second quarter (28%, 95% CI 24% to 32%;  $p = 0.01$ ) and fourth quarter (29%, 95% CI 22% to 36%;  $p = 0.009$ ). There was no difference between first and third quarter (25%, 95% CI 17% to 34%;  $p = 0.052$ ). Heterogeneity among studies was moderate ( $I^2 = 66\%$ ).

#### Conclusion/ Key Practice Points:

- Ankle sprain occurrence increases during a sport match, particularly between the first and second quarter, with no further increase in the remaining quarters.
- Fatigue/tiredness/exhaustion may explain the findings.
- These findings may contribute to strategies intended to prevent ankle sprains.

### THE EPIDEMIOLOGY OF KNEE AND ANKLE INJURIES IN BASKETBALL: A SYSTEMATIC REVIEW WITH META-ANALYSIS

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SPA9B, Meeting Room C4.4, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

To review the epidemiology of knee and ankle injuries in basketball, and compare the injury rates across level of play and between sexes.

#### Design:

Systematic review and meta-analysis.

#### Method:

Studies were identified through a search of Medline, CINAHL, Web of Science, Scopus and SPORTDiscus from inception to February 2017. Reference lists of selected studies were screened. Two independent reviewers screened papers for eligibility. The number of athlete exposures (AE), and knee, anterior cruciate ligament (ACL) and ankle injuries was extracted. Exposure and injury data from the included studies were aggregated to determine injury rates in high school, college and professional levels of play. Comparison was made across the levels of play, and between sexes. Quality analysis was made with an 8-point scale.

#### Results:

The search yielded 941 results. 42 articles met the study criteria, 15 with data on knee injury, 9 with ankle injury data, and 18 with both ankle and knee injury. The rate of ankle injury varied across levels of play, from 0.5-2.1/1000AE in high school, 1.2-1.8/1000AE in college, and 3.4-4.3/1000AE in professionals. Knee injury rates varied from 0.6-2.8/1000AE in high school, 0.8-1.4/1000AE in college, and 0.6-2.4/1000AE in professionals. Across all levels of play, knee and ACL injuries were 2-5 times more frequent in females than males.

#### Conclusion:

Ankle and knee injuries are common in basketball, with the highest rates of injury in professional players and in females. This has implications for developing targeted injury prevention programs for basketball populations.

## A COMPARISON OF FUNCTIONAL PERFORMANCE BETWEEN INDIVIDUALS WITH A CHRONIC ANTERIOR CRUCIATE LIGAMENT DEFICIENCY AND HEALTHY CONTROLS—WHO HAS COPEd?

**Kelley C<sup>1</sup>**, Keays S<sup>2,3</sup>, Bullock-Saxton J<sup>1,4</sup>, Newcombe P<sup>5</sup>, Constantinou M<sup>1</sup>

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<sup>3</sup>*University of the Sunshine Coast, , Australia*, <sup>4</sup>*Active Rehabilitation Physiotherapy, , Australia*, <sup>5</sup>*The University of Queensland, St Lucia, Australia*

SPA9B, Meeting Room C4.4, October 21, 2017, 10:35 AM - 11:35 AM

### Aim:

Firstly, we aimed to compare functional performance between an injured group and a control group. Secondly, we aimed to compare activity levels between pre- and post- injury. Thirdly, we aimed to classify individuals within the injured group as copers or non-copers.

### Design:

Cross-sectional study.

### Method:

Twelve individuals with chronic anterior cruciate ligament deficiency for over 10 years were age- and gender-matched with 12 healthy controls. The timed hop test assessed physical function. The Knee Outcome Survey-Activities of Daily Living, global rating score and number of episodes of giving way assessed self-reported function. Self-reported Tegner Activity Scale assessed activity levels at pre- and post- injury. An established set of criteria classified the injured group as copers or non-copers.

### Results:

There was no significant difference in the timed hop test between groups ( $p = 0.65$ ). The injured group reported significantly lower on the Knee Outcome Survey-Activities of Day Living ( $p = 0.001$ ) and the global rating score ( $p = 0.009$ ). Eleven of 12 individuals from the injured group reported episodes of giving way (mean = 9.3 times). Activity levels significantly decreased from pre- to post-injury ( $p < 0.001$ ). One participant was classified a copers.

### Conclusion / Key Practice Points:

- The injured group physically performed similarly to healthy controls; however, their self-reported function was lower.
- This may explain the decreased activity levels from pre- to post-injury.
- Based on criteria, the injured group had not coped.
- Future studies investigating how a decreased perception of function may affect activity levels post-injury are warranted.

## STOP HURTING WOMEN WITH EXERCISE

**Lo A<sup>1</sup>**

<sup>1</sup>*The Physio Detective, Sydney, Australia*

WMPH9A, Meeting Room C4.3, October 21, 2017, 10:35 AM - 11:35 AM

Physiotherapy has increasingly become a niche profession with the explosion of research and the promotion of evidence-based practice. We find that sub-specialities such as musculoskeletal, sports and women's health physiotherapy often don't discuss similar topics with each and the deep considerations of each group is often overlooked. The objective of this talk is to bring together the research and clinical evidence for pain, strength and conditioning, the fall of the biomechanical model, the rise of the biopsychosocial model and apply this to women's health problems like incontinence, pelvic organ prolapse, pain, diastasis rectus abdominis, osteoporosis and general health. Using this approach, Antony has been able to work with many women's health physiotherapists around the world in helping women do more than they or their therapist ever thought was possible without compromising their particular problem. He has also been able to educate fitness professionals to the problems of such topics as incontinence, prolapse, pain as well as pain science, the problems with postural education and numerous coaching cues which are problematic.

#### Key Practice Points:

- Approach testing your patients differently to determine if an intervention or cue or home exercise program is actually relevant and helpful for your patient
- Be exposed to some of the concepts Antony has developed to help these women that have been inspired by personal and clinical experience as well as informed by the evidence.

#### VARIATION IN URINARY CONTINENCE AFTER PROSTATECTOMY IS EXPLAINED BY DYNAMIC FEATURES OF STRIATED PELVIC FLOOR MUSCLE CONTRACTION

Stafford R<sup>1</sup>, van den Hoorn W<sup>1</sup>, Coughlin G<sup>1</sup>, **Hodges P<sup>1</sup>**

<sup>1</sup>The University of Queensland, Australia

WMPH9B, Meeting Room C4.5, October 21, 2017, 10:35 AM - 11:35 AM

#### Aim:

This study aimed to test whether dynamic features of muscular control of urinary continence measured with transperineal ultrasound imaging provide insight into why some men develop incontinence after prostatectomy whereas others do not.

#### Design:

Cross sectional study

#### Method:

Forty-two men aged 66(7) years (incontinent (N=19) and continent (N=23)) were recruited following prostatectomy. Transperineal ultrasound imaging was used to make recordings during evoked coughing and maximal voluntary contractions. Displacements of pelvic floor landmarks associated with activation of puborectalis, striated urethral sphincter and bulbocavernosus were measured. The urethral length was also calculated. A principal component analysis and multiple logistic regression were used to consider which factors best distinguish between men with and without incontinence.

#### Results:

Five principal components were identified that together explained 72.0% of the data. Two principal components representative of; (i) striated urethral sphincter activation and (ii) bulbocavernosus and puborectalis activation were significantly different between participants with and without incontinence. These components correctly identified 88.1% of incontinent men, with a specificity and sensitivity of 91.3% and 84.2%, respectively. Poor function of bulbocavernosus and puborectalis could be compensated by good sphincter function, but bulbocavernosus and puborectalis had less potential to compensate for poor sphincter function.

#### Conclusion/Key Practice Points:

- Dynamic features of pelvic floor muscle activation, particularly shortening of the striated urethral sphincter during cough and voluntary contraction, are related to continence status after prostatectomy.
- The next step is to test whether treatments that focus on training activation of the sphincter are effective for management of post prostatectomy incontinence.

#### SPECIALISED PHYSIOTHERAPY FOR IN-PATIENTS WITH DIABETES LEADS TO IMPROVED OUTCOMES

**Kay J<sup>1</sup>**, Edwards S<sup>1</sup>, Colman P<sup>1,2</sup>, Furlanos S<sup>1</sup>, Marley K<sup>1</sup>, Plumb S<sup>1</sup>

<sup>1</sup>Melbourne Health, Parkville, Australia, <sup>2</sup>The University of Melbourne, Parkville, Australia

CRP10A, Meeting Room C3.4, October 21, 2017, 11:40 AM - 12:40 PM

#### Aim:

The Victorian Department of Health and Human Services funded a six-month position to establish the feasibility of a specialised Physiotherapy position in diabetes, and the impact on patient outcomes. This was following an internal audit showing increased length of stay (LOS) and readmission rates for in-patients with diabetes.

Design: Prospective case series.

Method:

Inclusion criteria: in-patients with a diagnosis of diabetes, body mass index greater than 30kg/m<sup>2</sup>, and/or predicted LOS greater than 7 days. Exclusion criteria: refused intervention, already fulfilling Australian physical activity guidelines, were uncontactable, readmitted to hospital at six-weeks post-discharge, medically unable to exercise post-discharge, or deceased. Participants were allocated into intervention and non-intervention groups due to large referral numbers. Both groups received standard Physiotherapy care, with the intervention group (IG) receiving further exercises and consultation (establishing exercise goals, education, and problem-solving exercise barriers). All participants completed an International Physical Activity Questionnaire at baseline and six-weeks post-discharge, and a satisfaction survey.

Results:

During the intervention period 56 patients were recruited into the IG (N=36) and non-intervention group (N=20). Demographic data of the groups were comparable. The IG had a median LOS of 4.5 days less, and readmission rate 11% lower than the non-intervention group. At six-weeks post-discharge, participants in the IG were participating in an average of 62 minutes more moderate exercise per week.

Conclusion/Key Practice Points:

- This position demonstrated feasibility, with considerable benefits on LOS, and readmission rates. IG participants completed more exercise at follow-up, with wider benefits for patients and health providers in the area.

## GETTING TO THE HEART OF THE MATTER: A NATIONAL SURVEY OF HEART FAILURE EXERCISE REHABILITATION SERVICES IN AUSTRALIA

**Adsett J<sup>1</sup>**, Miller S<sup>2</sup>, Mandrusiak A<sup>2</sup>

<sup>1</sup>Royal Brisbane and Women's Hospital, Herston, Australia, <sup>2</sup>The University of Queensland, St Lucia, Australia

CRP10A, Meeting Room C3.4, October 21, 2017, 11:40 AM - 12:40 PM

Aim:

To capture current exercise rehabilitation practices for people with heart failure across Australia, and to compare these with best-practice guidelines for this condition. To identify relevant issues impeding access to these services, and how these barriers compare to those experienced in other parts of the world.

Design:

Cross-sectional survey of cardiac and heart failure rehabilitation centres in Australia.

Methods:

An online survey (SurveyMonkey®) was emailed to all potential facilities. Questions encompassed: service and programme characteristics; perceived barriers; and exercise training specifics. Hard copy surveys were posted to those who failed to complete the online survey.

Results:

Three hundred and thirty-four of 457 services (73%) responded to the survey, of which 75% reported providing exercise rehabilitation programmes for people with heart failure. Insufficient funding (60%), staffing (56%) and clinical resources (53%) were the predominant reasons cited for not providing this service. Twenty-three percent of facilities reported that patients with heart failure in their local area were unable to access appropriate exercise guidance, of which 81% were located in regional or remote areas. Programme and exercise training characteristics aligned well with current best-practice guidelines.

Conclusions / Key Practice Points:

Results from this study suggest that exercise rehabilitation programs for people with heart failure in Australia are implemented in accordance with current best-practice guidelines. However, key barriers were identified and may inform future practice in this area, particularly for those in rural and remote centres. Findings are limited to those who completed the survey and should be generalised with caution.

## SINGING FOR COPD: A COCHRANE REVIEW

**McNamara R<sup>1</sup>**, Epsley C<sup>2</sup>, Coren E<sup>2</sup>, McKeough Z<sup>3</sup>

<sup>1</sup>Prince of Wales Hospital, Randwick, Australia, <sup>2</sup>Canterbury Christ Church University, Canterbury, United Kingdom, <sup>3</sup>The University of Sydney, Lidcombe, Australia

CRP10A, Meeting Room C3.4, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

To determine the effect of singing on health-related quality of life and dyspnoea in people with COPD.

### Design:

A systematic review of randomised controlled trials.

### Method:

Trials were identified from the Cochrane Airways Group's Specialised Register. Studies examining structured supervised singing training of at least four weeks' duration with a minimum of four sessions were included. The singing could be performed individually or as part of a group (choir) facilitated by a singing teacher, with/without pulmonary rehabilitation. Primary outcomes were health-related quality of life and dyspnoea. Risk of bias was assessed.

### Results:

Three studies (n=112 participants) were included (mean age range 67-72 years; mean FEV1 range 37-53% predicted). All studies randomised participants to a singing group or a control group. The frequency of the singing intervention in the studies ranged from 1-2 times a week over 6-24 weeks. The duration of the singing sessions were 60 minutes. The overall study quality was moderate. Singing significantly improved health-related quality of life measured by the SF-36 PCS score (MD 12.64, 95% CI 5.50 to 19.77; 2 studies; n=52). Dyspnoea was measured in one study (n=30), and did not improve (BDI score MD 0.40, 95% CI -0.65 to 1.45). No adverse events were reported.

### Conclusion/Key Practice Points:

- Singing improved the physical component of health-related quality of life in people with COPD.
- The limited number of studies precludes conclusions about the effect of singing on dyspnoea.
- Future large randomised controlled trials are necessary for evidence of effectiveness of singing in people with COPD.

## INNOVATIVE STRATEGIES TO STRENGTHEN PATIENT ENGAGEMENT IN CHRONIC DISEASE MANAGEMENT

**Redfern J<sup>1</sup>**

<sup>1</sup>Westmead Clinical School, Sydney Medical School, University of Sydney, ,

CRP10A, Meeting Room C3.4, October 21, 2017, 11:40 AM - 12:40 PM

Supporting individual patients to engage in evidence-based healthcare is a challenge for health systems across the world. Human behaviour is influenced by many factors and no two people are the same. With the increasing burden of non-communicable diseases we are faced with a need to develop flexible, adaptable and scalable strategies that engage both patients and communities. The proliferation of mobile technology and mobile device ownership offers a promising opportunity to deliver evidence-based healthcare interventions to more people in an efficient way. The aim of this presentation is to provide an overview of the evidence and availability of innovative strategies that support patient engagement and behaviour change. A variety of patient-directed apps will be reviewed along with broader literature about the need for rapid generation of evidence. Examples will include text messaging services, gamification strategies and patient data integration with their primary care provider's electronic systems. The presentation will also explore qualitative data pertaining to patient preference and usefulness. It is intended that delegates will gain insight into new ways in which mhealth can be used in clinical practice to support preventive healthcare in an efficient and scalable way.

## MECHANISM OF LIMITATION TO EXERCISE IN SURVIVORS OF ACUTE LUNG INJURY AS IDENTIFIED VIA A LABORATORY BASED EXERCISE TEST

**Mackney J<sup>1,2</sup>**, Jenkins S<sup>1,3,4</sup>, Havill K<sup>5</sup>, Harrold M<sup>1</sup>, Hill K<sup>1,3</sup>

<sup>1</sup>Curtin University, Perth, Australia, <sup>2</sup>The University of Newcastle, Callaghan, Australia, <sup>3</sup>Institute for Respiratory Health, Perth, Australia, <sup>4</sup>Sir Charles Gairdner Hospital, Perth, NSW, <sup>5</sup>John Hunter Hospital, Newcastle, Australia

CRP10B, Meeting Room C3.5, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

To determine the causes of exercise limitation in survivors of acute lung injury (ALI).

### Design:

A prospective observational study.

### Methods:

Ten survivors of ALI were recruited during an admission to intensive care (ICU). Data pertaining to the ICU admission were extracted from the medical notes. Six weeks following hospital discharge, participants completed pulmonary function tests and a laboratory-based incremental cycle ergometry test (ICET).

### Results:

Participants (five male) were aged (mean±SD) 51±14 years. Duration of mechanical ventilation was 8.7±1.8 days. Diffusion capacity of the lung was reduced (median [IQR], 50 [44-75] %predicted). During the ICET, reductions were observed in peak work rate (64±24 %predicted), peak rate of oxygen consumption (VO<sub>2</sub>peak) (71±23 %predicted) and anaerobic threshold (AT) (72±19 %predicted). ICET was limited by leg fatigue in all participants. Examination of ICET responses revealed that eight participants had a reduced VO<sub>2</sub>peak and AT, of whom, seven demonstrated an elevated ventilatory equivalent for carbon dioxide at AT and one arterial oxygen desaturation (<85%). Two participants exhibited signs of asymptomatic cardiac ischaemia. The causes of exercise limitation were deconditioning (n=7), reduced pulmonary diffusion (n=8) and cardiac impairment (n=2).

### Conclusions/Key Practice Points:

- Deconditioning which limits exercise capacity is common among survivors of ALI and suggests exercise training may be of benefit.
- Reduced pulmonary diffusion may be present, but it was not common for this to translate into oxygen desaturation during cycling.
- The presence of cardiac impairment is of concern and screening prior to exercise prescription may be important.

## RELATIONSHIP BETWEEN MEASURES OBTAINED DURING AN INCREMENTAL CYCLE ERGOMETRY TEST AND THE SIX-MINUTE DISTANCE IN SURVIVORS OF ACUTE LUNG INJURY

**McLennan B<sup>1</sup>**, Mackney J<sup>1,2</sup>

<sup>1</sup>The University of Newcastle, Newcastle, Australia, <sup>2</sup>Curtin University, Perth, Australia

CRP10B, Meeting Room C3.5, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

To examine the relationship between exercise capacity and peak work achieved during a cycle ergometry test (ICET) and the six-minute walk distance (6MWD) in survivors of acute lung injury (ALI).

### Design:

Observational cohort study

### Methods:

Nine survivors of ALI were recruited during and admission to intensive care (ICU). Data pertaining to the ICU admission were extracted from the medical notes. Six weeks after hospital discharge, participants completed a single ICET and two six-minute walk tests.

#### Results:

Median [IQR] age was 43 [9-63] years, duration of mechanical ventilation was 9 [7-10] days and hospital length of stay was 23 [19-56] days. Reductions were observed in peak oxygen consumption achieved during the ICET (VO<sub>2</sub>peak) (1.4 [1.2-1.9] L/min) and 6MWD (507 [471-619] m). The VO<sub>2</sub>peak and anaerobic threshold (L/min) were both associated with 6-minute walk work (6MWD x body weight) ( $r = 0.77$ ,  $p = 0.016$  and  $r = 0.97$ ,  $p < 0.001$  respectively), but not 6MWD ( $r = -0.23$ ,  $p = 0.55$  and  $r = -0.30$ ,  $p = 0.43$  respectively). The equation derived to predict peak cycle work rate (Watts) was  $1.932 \times 6\text{-minute walk work (km.kg)} + 14.676$  ( $p = 0.014$ , adj  $r^2 = 55\%$ , SE =14 Watts).

#### Conclusion/Key Practice Points:

- In survivors of acute lung injury, 6-minute walk work is more strongly associated with both VO<sub>2</sub>peak and anaerobic threshold than 6MWD.
- Prescription of exercise-based rehabilitation may be enhanced by the use of an equation to derive peak cycle work rate from commonly used six-minute walk test.

#### DOES FRAILTY SCORE AND SIX-MINUTE WALK DISTANCE PREDICT PATIENT SURVIVAL AND OUTCOME AFTER LUNG TRANSPLANTATION – A RETROSPECTIVE DATABASE ANALYSIS

**Patel S<sup>1,2</sup>**, Butler J<sup>1</sup>, Elkins M<sup>1</sup>, Glanville A<sup>2</sup>, Ntoumenopoulos G<sup>2,3</sup>

<sup>1</sup>Australian Catholic University, North Sydney, Australia, <sup>2</sup>St Vincent's Hospital, Darlinghurst, Australia,

<sup>3</sup>University of Technology, Sydney, Australia

CRP10B, Meeting Room C3.5, October 21, 2017, 11:40 AM - 12:40 PM

#### Aim:

To evaluate whether there is a relationship between pre-operative frailty score and six-minute walk distance, and outcome after lung transplantation.

#### Design:

Retrospective database analysis

#### Method:

Adult lung transplant recipients at St Vincent's Hospital, Sydney between February 2013 and October 2016 with available pre- and post-transplant data were included. Pre-operative six-minute walk distance was dichotomised to less or greater than 400 m. Frailty was based on the "Frailty Phenotype", and defined as an accumulated score of  $\geq 3/5$ . Chi-square and paired t-tests allowed between group comparisons for post-transplant outcomes.

#### Results:

A total of 124 recipients were analysed ( $n=67$  for six-minute walk distance;  $n=124$  for frailty). Pre-operative six-minute walk distance was not associated with intensive care (95%CI -11 to 7) and hospital length of stay (95%CI -14 to 12), time on mechanical ventilation (95%CI -3 to 2), discharge destination (95%CI 0.9 to 1.6), and 30-day survival (95%CI 0.96 to 1.26) post-transplantation. Pre-operative frailty was associated with increased time in intensive care (95%CI 2 to 16), and hospitalisation (95%CI 7 to 31) and death prior to discharge (95%CI 1.4 to 23.2). However, frailty was not associated with time on mechanical ventilation (95%CI -1 to 4), discharge destination (95%CI 0.4 to 1.0) and 30-day survival (95%CI 1.00 to 1.06) post-transplantation.

#### Conclusion/Key Practice Points:

- Pre-transplant six-minute walk distance was not associated with post-transplant outcome. However, pre-transplant frailty was associated with time spent in intensive care and hospital, and death prior to discharge.
- Pre-operative frailty measures could assist to predict recipients' outcome after lung transplantation.

## COMMUNICATING ABOUT PHYSICAL ACTIVITY DURING CLINICAL ENCOUNTERS AND VIA REMOTE-COMMUNICATION: A SERIES OF SUB-GROUP ANALYSES AMONG MIDDLE-AGED AND OLDER ADULTS

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GPA10, Meeting Room C3.6, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

To examine how middle-aged and older adults perceive and report physical activity, including assessment-induced changes in self-perceptions, and desire to receive remote-support as an outpatient.

### Design:

Two cohort studies were conducted.

### Method:

Study-1 participants (mean (SD) age 63 (9) years) reported self-reported whether they were sufficiently physically active for health benefits, then self-reported the type and duration of physical activity they completed in the past week (Active Australia Survey). Participants were again asked if they were sufficiently physically active and were permitted to retain or alter their initial response. The proportion of patients who altered their response and clinical factors associated with patients' responses were examined. Study-2 participants (total 224) reported whether they would like additional support to increase their physical activity levels, as well as their preferences for receiving that support.

### Results:

Initially, 56/140 (40%) of participants reported being sufficiently physically active. After completing the Active Australia Survey, 22/56 (39%) of these patients changed their response to indicate they were not sufficiently physically active. Among participants aged 50 to 84 years, 90% desired to be more physically active and typically preferred to receive remote-support via post or telephone calls. Older age was associated with lower preference ratings for technology-focused communications (text-messaging, email and social media, all  $p < 0.001$ ).

### Conclusion/Key Practice Points:

- Patients self-reporting of sufficiency and desire to be physically active may be influenced by even simplistic self-reflection in clinical settings.
- Older adults preferred more traditional methods for receiving remote-communication to receive physical-activity promoting interactions as outpatients.

## AMOUNT (Activity and MObility UsiNg Technology) REHABILITATION TRIAL: TECHNOLOGIES USED AND PARTICIPANT PERCEPTIONS IN THE INPATIENT SETTING

**Hassett L**<sup>1,2</sup>, van den Berg M<sup>3</sup>, Weber H<sup>3</sup>, Moran F<sup>4</sup>, Rabie A<sup>5</sup>, Wong S<sup>4,5</sup>, Chagpar S<sup>4</sup>, Dakopoulos A<sup>3</sup>, Miles A<sup>3</sup>, Crotty M<sup>3</sup>, Sherrington C<sup>1</sup>

<sup>1</sup>School of Public Health, Sydney Medical School, The University of Sydney, Camperdown, Sydney, Australia, <sup>2</sup>Faculty of Health Sciences, The University Of Sydney, Lidcombe, Sydney, Australia, <sup>3</sup>Department of Rehabilitation, Aged and Extended Care, Flinders University, Adelaide, Australia, <sup>4</sup>The George Institute for Global Health, Sydney Medical School, The University of Sydney, Newtown, Sydney, Australia, <sup>5</sup>South Western Sydney Local Health District, Sydney, Australia

GPA10, Meeting Room C3.6, October 21, 2017, 11:40 AM - 12:40 PM

### Aims:

To determine if participants perceived technologies as enjoyable and easy to use and factors influencing this within inpatient rehabilitation.

### Design:

Process evaluation within a randomised controlled trial.

#### Methods:

One hundred and forty nine participants (52% male; mean age 70 (SD18); 41% of participants had not used a computer, tablet, smartphone, pedometer or gaming console in the month prior to hospitalisation) were randomised to the intervention group. The intervention was additional to standard care, prescribed individually according to a protocol which matched games/exercises from technologies to address participants' mobility limitations and increase physical activity. Both commercially-available (Nintendo Wii; Xbox Kinect; Fitbit; Smartphone apps) and rehabilitation-specific devices (Humac; Fysiogaming; Stepping Tiles; exercise iPad apps) were used. Outcome measures were technology use and Physical Activity Enjoyment (PACES; 18-126) and System Usability Scales (SUS; 0-100), for which higher scores are better.

#### Results:

Participants used on average 4 (SD1) technologies with the Fitbit (84%), iPad apps (77%) and Humac (61%) most prescribed and commercially-available exergames and Smartphone apps used least. At 3 weeks, participants perceived technology use as enjoyable and rated usability above average (mean (SD) PACES 95.4 (23.2); SUS 72.2 (18.8)). Enjoyment and usability were positively related to previous technology use ( $p < 0.01$ ) and younger age ( $p \leq 0.03$ ). Previous technology use remained associated with usability after adjustment for other factors ( $p=0.003$ ).

#### Conclusion/Key Practice Points:

- Tailored prescription of technologies enables enjoyment and ease of use for people participating in inpatient rehabilitation.
- Previous technology use should be considered when prescribing technology in rehabilitation.

#### UPTAKE OF HOME EXERCISE AFTER FALL RELATED LOWER LIMB FRACTURE: RESTORE TRIAL INTERVENTION

**Kirkham C<sup>1</sup>**, Sherrington C<sup>1</sup>

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GPA10, Meeting Room C3.6, October 21, 2017, 11:40 AM - 12:40 PM

#### Aims:

To describe the design and delivery of a home exercise intervention for older people after fall-related lower limb fracture.

#### Design:

Interview data from 168 intervention group participants and study physiotherapists.

#### Methods:

Study participants ( $n=336$ ) were aged 60 years and over, had sustained a fall-related lower limb or pelvic fracture in the previous two years, were living at home and had completed active rehabilitation. The intervention group received 10 physiotherapist home visits and 5 follow-up telephone calls, were given an individualised home program of strength and balance exercises and fall prevention education. Uptake of the intervention, adherence, barriers and acceptability of the intervention were measured with a self-reported survey and exercise diary and estimated by the study physiotherapist.

#### Results:

The physiotherapist home visit mean uptake (SD) was 8.4 (2.9) and phone call uptake 4.3 (1.9). Intervention adherence declined over 12 months. At 12 months 110 participants (65%) were continuing to exercise at home. The number of repetitions/session averaged 91 repetitions/session over 12 months for those continuing to exercise. Factors around medical conditions and pain were most reported as barriers to exercise and progression of exercise. The program acceptability survey found enjoyment and use of the program to be positive. There were seven reported adverse events and no falls or cardiovascular events while performing exercise.

#### Conclusions/Key Practice Points:

- It is possible to teach a safe home exercise program to older people up to two years after a fall-related fracture.
- Medical conditions and pain limited participation.
- Intervention adherence decreased over time.

#### FACTORS ASSOCIATED WITH THE SETTING OF HEALTH-RELATED GOALS AMONG COMMUNITY-DWELLING OLDER PEOPLE

**Oliveira J<sup>1</sup>**, Hassett L<sup>1,2</sup>, Sherrington C<sup>1</sup>, Ramsay E<sup>1</sup>, Kirkham C<sup>1</sup>, Manning S<sup>3</sup>, Tiedemann A<sup>1</sup>

<sup>1</sup>School of Public Health, Sydney Medical School, The University of Sydney, Sydney, Australia, <sup>2</sup>Faculty of Health Sciences, The University Of Sydney, Lidcombe, Sydney, Australia, <sup>3</sup>School of Biomedical Sciences, Charles Sturt University, Orange, Australia

GPA10, Meeting Room C3.6, October 21, 2017, 11:40 AM - 12:40 PM

#### Aim:

To describe the health-related goals set by community-dwelling older people and to explore gender differences in goal selection, and associations between balance-related goals and fall history, self-rated balance and fear of falling.

#### Design:

A cross-sectional study.

#### Methods:

Community-dwelling people aged 60+ participating in two randomised controlled trial aimed to promote physical activity were included. Participants nominated two health-related goals, which were categorised into components of the International Classification of Functioning, Disability and Health (ICF). Chi-square analyses were used to explore associations between goal types and participant characteristics.

#### Results:

Participants were 205 people with a mean age of 70.9 years (SD= 8.5, 63% females). They selected 408 goals classified into 20 different ICF categories. The most commonly nominated goals were recreation and leisure (n= 171, 42%), and walking (n=136, 33%). Men and women set similar goals. A significantly higher proportion of participants with poor/fair self-rated balance selected a balance-related goal (n=25, 44%) compared to the proportion with good balance (n=43, 29%, p=0.04). The proportion of fallers that selected a balance-related goal (n=23, 37%) was similar to the proportion of non-fallers that did so (n=45, 32%, p=0.43). People with self-rated fear of falling were as likely to select a balance-related goal, (n=24, 38%) as people with no fear of falling (n=44, 31%, p=0.38).

#### Conclusions/Key Practice Points:

- Goals related to recreation and leisure and walking were the most common health-related goals selected.
- Participants who had poor/fair self-reported balance were more likely to set a balance-related goal than people with good self-rated balance.

#### DIAGNOSING GLUTEAL TENDINOPATHY

**Grimaldi A<sup>1,2</sup>**, Vicenzino B<sup>2</sup>, Mellor R<sup>2</sup>, Hodges P<sup>2,3</sup>, Bennell K<sup>4</sup>

<sup>1</sup>Physiotec, Tarragindi, Australia, <sup>2</sup>The University of Queensland, School of Health and Rehabilitation Sciences: Physiotherapy, Brisbane, Australia, <sup>3</sup>NHMRC Centre of Clinical Research Excellence in Spinal Pain, Injury and Health, The University of Queensland, Brisbane, Australia, <sup>4</sup>Department of Physiotherapy, Centre for Health, Exercise and Sports Medicine, University of Melbourne, Melbourne, Australia

MPA10A, Darling Harbour Theatre, October 21, 2017, 11:40 AM - 12:40 PM

#### Aim:

Determine the diagnostic utility of clinical tests for gluteal tendinopathy, using Magnetic Resonance Imaging (MRI) as the reference standard.

Design:  
Diagnostic utility study.

Methods:

Sixty-five community dwelling adults reporting lateral hip pain were recruited. A battery of pain provocation tests (e.g., (a) those that combine compressive positions with isometric contractions: flexion/adduction/external rotation  $\pm$  isometric internal rotation, and sidelying hip adduction  $\pm$  isometric abduction; (b) single leg stance sustained for 30seconds; (c) flexion/abduction/external rotation and (d) palpation) were investigated regarding their usefulness in clinical diagnosis of gluteal tendinopathy. Positive tests were determined by pain reproduction over the greater trochanter. An MRI diagnosis of gluteal tendinopathy required an increase in intratendinous signal intensity on T2-weighted images as determined by an experienced radiologist, blind to the clinical examination findings.

Results:

Palpation had highest sensitivity (80%) and accuracy (72%) and the lowest (best) negative likelihood ratio (0.43). All other clinical tests had high specificity (87-100%), with tests that involved an active muscle contraction most useful in increasing the probability that gluteal tendinopathy would be detected on MRI (positive likelihood ratio's:5.7–12.2). . Twenty participants (31%) had gluteal tendinopathy on MRI but were negative clinically.

Conclusion/Key Practice Points:

- Patients with lateral hip pain who are not palpably tender over the greater trochanter are unlikely to have MRI-detected gluteal tendinopathy.
- Tests involving active muscle contraction in tendon compressive positions are most useful for ruling in gluteal tendinopathy
- Lateral hip pain within 30 s of single leg stance indicates high likelihood of gluteal tendinopathy.

## PSYCHOLOGICAL AND LIFESTYLE FACTORS BUT NOT PHYSICAL FACTORS REFLECT GLUTEAL TENDINOPATHY SEVERITY

**Plinsinga M<sup>1</sup>**, Mellor R<sup>1</sup>, Hodges P<sup>1,3</sup>, Bennell K<sup>4</sup>, Grimaldi A<sup>1,2</sup>, Vicenzino B<sup>1</sup>

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Aim:

Identify a broad range of health characteristics associated with more severe pain and disability compared to less severe cases in gluteal tendinopathy.

Design:

Cross-sectional cohort study.

Method:

Two hundred and three participants (mean age 55 years, 82% female) meeting a clinical diagnosis of gluteal tendinopathy with MRI confirmation were included. Pain and disability was measured with the VISA-G questionnaire, a validated patient reported outcome measure for gluteal tendinopathy. Physical and psychosocial characteristics were recorded. A cluster analysis using the VISA-G scores was performed. Group differences on characteristics were evaluated with an ANCOVA followed by a Bonferroni post hoc test, sex included as a covariate. Significance was set at 0.05.

Results:

Three VISA-G clusters were identified; mild, moderate and severe. Pain catastrophizing and depression scores were higher and pain self-efficacy scores were lower in the moderate and severe groups compared to the mild group. Lower vigorous activity levels and lower quality of life was reported in the severe group compared to the mild group. Hip abductor muscle strength, waist girth and waist-hip ratio were greater in men than women but similar across mild, moderate and severe groups.

Conclusion/Key Practice Points:

- Individuals with greater severity of pain and disability accompanying their gluteal tendinopathy present with psychological and lifestyle factors.
- Psychosocial assessments and interventions in individuals with high severity of pain and disability should be considered.

PHYSICAL AND BIOMECHANICAL IMPAIRMENTS IN INDIVIDUALS WITH SYMPTOMATIC GLUTEAL TENDINOPATHY

**Allison K<sup>1</sup>**, Vicenzino B<sup>2</sup>, Grimaldi A<sup>2,3</sup>, Hodges P<sup>2,4</sup>, Bennell K<sup>1</sup>

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Aim:

Compare hip abductor muscle strength and walking biomechanics between individuals with and without gluteal tendinopathy.

Design:

Cross-sectional study

Methods:

Three-dimensional walking-gait analysis was conducted on 40 individuals aged 35-70 years with unilateral gluteal tendinopathy and 40 pain-free controls. Maximal isometric hip abductor strength was also assessed on an additional 10 participants for each group. An analysis of covariance was used to compare strength, kinematic and kinetic variables between groups. Linear regression was performed to investigate the relationship between kinematics and external hip adduction moment in the gluteal tendinopathy group during walking.

Results:

Individuals with gluteal tendinopathy exhibited 0.35Nm/kg (32%) less hip abductor strength than controls and a greater hip adduction moment throughout stance than controls (standardized mean difference ranging from 0.60 (early stance) to 0.90 (late stance)). Contralateral trunk lean during early stance was 1.2 degrees greater ( $p=0.04$ ), and pelvic drop during late stance 1.4 degrees greater ( $p=0.04$ ), in individuals with gluteal tendinopathy. Two trunk and pelvic strategies were identified within the gluteal tendinopathy group. Contralateral pelvic drop was significantly correlated with the first ( $R=0.35$ ) and second peak ( $R=0.57$ ) hip adduction moment, and hip adduction angle with the second peak hip adduction moment ( $R=-0.36$ ) in those with gluteal tendinopathy.

Conclusion/Key practice points:

- Hip abductor muscle weakness is a feature of gluteal tendinopathy
- Individuals with gluteal tendinopathy exhibit greater hip adduction moments and alterations in trunk and pelvic kinematics during walking
- Findings provide preliminary evidence to consider abductor strength and gait retraining in those with gluteal tendinopathy

## MOTOR CONTROL IMPAIRMENTS IN INDIVIDUALS WITH SYMPTOMATIC GLUTEAL TENDINOPATHY

Allison K<sup>1</sup>, **Hodges P**<sup>2,3</sup>, Grimaldi A<sup>1</sup>, Vicenzino B<sup>2</sup>, Bennell K<sup>1</sup>

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### Aim:

Investigate muscle activation patterns in individuals with and without gluteal tendinopathy.

### Design:

Cross-sectional study

### Method:

Fine-wire electromyography electrodes were inserted into the segments of the gluteus minimus and medius muscles, and surface electrodes were placed over the tensor fascia lata, upper gluteus maximus and vastus lateralis muscles of thirteen individuals with, and thirteen without, gluteal tendinopathy. Participants underwent six walking trials. Wavelet-based linear effects models and muscle synergy analysis were used to compare patterns of muscle activation between groups and to study variation within- and between-participants.

### Results:

Individuals with gluteal tendinopathy exhibited a more sustained initial burst of EMG of the posterior gluteus minimus and middle gluteus medius muscle segments into mid-stance (a period when activity of these muscles reduced in controls), and less within-subject variability of posterior gluteus medius and between-subject variability of anterior gluteus minimus, medius and upper gluteus maximus ( $p < 0.05$ ). Two muscle synergies were identified; Synergy-1 activated in early-mid stance and Synergy-2 in early stance. In participants with gluteal tendinopathy, posterior gluteus minimus, posterior gluteus medius and tensor fascia lata contributed more to Synergy-1 activity during the period of single leg support.

### Conclusion/Key Practice Points:

- Individuals with gluteal tendinopathy exhibit modified muscle activation patterns during walking, notably sustained activation of the gluteus minimus and medius and reduced variability, with potential relevance for tendon overload.
- Less variability and sustained activation may be required to compensate for hip abductor weakness.
- Interventions for motor control and strength may be relevant in the management of gluteal tendinopathy.

## AN EVIDENCE INFORMED APPROACH TO DESIGNING EDUCATION, LOAD MANAGEMENT AND EXERCISE FOR GLUTEAL TENDINOPATHY

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### Aim:

Design an evidence informed physiotherapy approach for management of symptomatic gluteal tendinopathy

### Design:

Narrative review

#### Method:

Design of a physical therapy management approach for gluteal tendinopathy was based on available evidence on tendon biology in health and pathology, particularly with reference to tendon loading.

#### Results:

Current evidence suggests that excessive tendon compression and tension, especially involving high load stretch shortening cycles, is catabolic and detrimental to tendon health. A priority in the management of tendinopathies, especially insertional, is to avoid compressive loads. Such compressive loads on gluteal tendons and associated bursae over the greater trochanter occur in positions of hip adduction. Tensile loading programs applied with gradual progression, allowing time for tendon adaptation and including heavy slow loading can be useful for stimulating positive adaptations within the tendon while also engendering pain relief. The management of gluteal tendinopathy requires control of these loads and integral to this is the use of specific progressive and graduated exercise, based on a good understanding of the underlying mechanisms through a specific education program.

#### Conclusion/Key Practice Points:

- Education includes advice to minimise compressive and inappropriate tensile loading
- Compression occurs in positions of hip adduction such as crossed-knee sitting, buttock (hip flexion/adduction) and ITB stretches
- Exercise programs should address strength and motor control deficits, which are associated with excessive hip adduction during function
- Heavy slow loading at an intensity of more than 40% maximal voluntary contraction can stimulate changes in muscle strength, bulk and tendon structure.

### EDUCATION AND EXERCISE VERSUS ULTRASOUND-GUIDED CORTICOSTEROID INJECTION VERSUS A WAIT AND SEE APPROACH FOR GLUTEAL TENDINOPATHY: A RANDOMISED CLINICAL TRIAL

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#### Aim:

Evaluate clinical efficacy of an 8-week physiotherapist led education and exercise program compared to ultrasound guided corticosteroid injection (Injection) and a wait and see approach.

#### Design:

Randomised clinical trial (Registration: ANZCTR #:12612001126808; Protocol:BMCDi:10.1186/s12891-016-1043-6)

#### Methods:

Participants with MRI confirmed diagnosis of gluteal tendinopathy were randomly allocated into one of three groups and followed up at 4, 8, 12, 26 and 52 weeks on a range of outcome measures (Primary: Global Rating of Change, Pain; Secondary: patient rated outcomes of quality of life, physical function and psychological factors). Analysis performed blind to group allocation by independent statistician with statistical analysis plan published a-priori (<http://dx.doi.org/10.14264/uql.2016.990>).

#### Results:

204 participants aged 55 (SD: 8.9) years were allocated to education and exercise (69), injection (66) or waiting (69). They were predominantly female (82%) with BMI of 27.4 (5.1) kg.m<sup>-2</sup>. Gluteal tendinopathy was 24 months median duration (IQR: 40), largely unilateral (77%) with pain 4.8 (1.1) /10, and VISA-G score of 60 (13) /100. Data on outcomes will be presented at the conference – analysis to be completed prior to conference symposia.

#### Conclusion/Key Practice Points:

- Physiotherapist led education and exercise program could provide a better option to corticosteroid injection or wait and see in the short term
- This randomised clinical trial is adequately powered to determine such assertions.

#### DO PATIENTS DISCHARGED FROM ADVANCED PRACTICE ORTHOPAEDIC AND NEUROSURGICAL SCREENING CLINICS RE-PRESENT TO SPECIALIST MEDICAL SERVICES?

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MPA10B, Meeting Room C4.8, October 21, 2017, 11:40 AM - 12:40 PM

#### Aim:

The aim of the study was to determine the rate of re-referral to specialist out-patient clinics for patients previously managed and discharged from advanced practice neurosurgical and orthopaedic physiotherapy screening clinic services in three metropolitan hospitals.

#### Design:

Retrospective audit

#### Methods:

A retrospective audit was undertaken of 462 patient cases with non-urgent musculoskeletal conditions discharged between 1 April 2014 and 30 March 2015 from three metropolitan hospitals. These patients had been discharged from the advanced practice physiotherapy-led service without requiring specialist medical review. Rates and patterns of re-referral to specialist orthopaedic, neurosurgical, chronic pain, or rheumatology services within 12 months of discharge were investigated.

#### Results:

Forty-six of the 462 patients (10.0%) who were managed by the physiotherapy-led service were re-referred to specialist medical orthopaedic, neurosurgical, chronic pain or rheumatology departments within 12 months of discharge. Only 22 of these patients (4.8%) were re-referred for the same condition as managed previously and discharged.

#### Conclusion:

Ninety-five per cent of patients with non-urgent musculoskeletal conditions managed by advanced practice physiotherapy-led services at three metropolitan hospitals did not re-present to access public specialist medical services for the same condition within 12 months of discharge.

#### Key Practice Points:

- Advanced practice musculoskeletal physiotherapy services are commonly established to assist in managing demand on public hospital specialist outpatient services
- The findings of this study support the effectiveness of advanced practice musculoskeletal physiotherapy service models in managing patients referred to Neurosurgery and Orthopaedic services.

## A RAPID REVIEW OF BEST PRACTICE MANAGEMENT OF LOW BACK PAIN IN THE EMERGENCY DEPARTMENT

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MPA10B, Meeting Room C4.8, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

To identify best practice for the assessment and management of patients with low back pain (LBP) in the Emergency Department (ED) through a systematic rapid review methodology.

### Design:

A systematic rapid review of primary studies, systematic reviews and guidelines related to LBP management in EDs.

### Method:

PubMed, CINAHL, EMBASE, TRIP and the grey literature were searched. Articles published in the last ten years that addressed acute low back pain assessment, management or prognosis in the ED were included. Data extraction and quality appraisal of included articles was conducted.

### Results:

The search revealed 1538 articles, of which 38 were included in the review. Consistent high-level evidence was found to support the use of 'red flags' to screen for serious pathologies, diagnostic tests being reserved for use only in the presence of red flags, the judicious prescribing of opioids, identification of psychosocial risk factors as predictors of poorer outcome, and promotion of early return to work and function.

### Conclusion / Key Practice Points:

- LBP is a common presentation to the ED and is often associated with high rates of imaging, misuse and overuse of pharmacology, and subsequent financial implications.
- High level evidence supports the use of red flags, judicious use of imaging and opioids, the identification of yellow flags, and promotion of early return to work and function.
- Utilising the best available evidence presented in this review will enable clinicians to risk stratify and enhance the quality of care they provide in the ED, optimising patient outcomes.

## WHY PATIENTS PRESENT TO PRIVATE PRACTICE PHYSIOTHERAPISTS: A SURVEY OF THE ADULT PHYSIOTHERAPY PATIENT POPULATION

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MPA10B, Meeting Room C4.8, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

To investigate the aspects of physiotherapy care patients consider most important when presenting to a primary-care physiotherapist and explore patient factors which influence this.

### Design:

A cross-sectional survey of consecutive adult patients presenting to private practice primary-care physiotherapists.

### Methods:

500 consecutive adult patients (≥18 years) presenting to primary-care physiotherapists were recruited from 10 private practices within the Sydney metropolitan area, ensuring geographic and socioeconomic variance. All patients completed a survey assessing how important five aspects of physiotherapy care were in their

initial decision to present for care, including treatment for: pain relief; improved function; diagnosis; information and education; and prevention. An open-ended question assessed other important aspects. The survey collected demographic information and patient factors potentially influencing aspects of care individual patients consider important. Descriptive statistics and univariate logistic regression were used to analyse the data.

#### Results:

A 93.8% survey response rate was achieved. All five aspects of care investigated were considered either 'quite important' or 'extremely important' (pain relief 89.2%; improved function 92.6%; diagnosis 65.2%; information and education 67.6%; prevention 90.0%). When reviewing patients' 'extremely important' rankings, diagnosis, or information and education had approximately half the rating of pain relief, improved function, or prevention. Several patient factors were also found to influence patients' rating of importance.

#### Key Practice Points:

- Patients presenting to primary care physiotherapists value several aspects of care and do not simply want treatment of pain
- Patient characteristics are associated with what individual patients consider the most important reason for presenting to a physiotherapist.

### ARE NOVEL MODELS OF SERVICE DELIVERY ACCEPTABLE TO USERS? QUALITATIVE FINDINGS FROM THE IMPACT TRIAL

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MPA10B, Meeting Room C4.8, October 21, 2017, 11:40 AM - 12:40 PM

#### Aim:

Explore patients' and physiotherapists' experience with Skype™ as a service model for exercise management of knee OA.

#### Design:

Qualitative study nested within the intervention arm of the IMPACT randomised controlled trial.

#### Method:

The Donabedian model for quality assessment in health care (structure, process and outcomes) informed semi-structured individual interview questions. Twelve purposively-sampled patients with knee OA who received physiotherapist-prescribed exercise over Skype™, and all therapists (n = 8) who delivered the intervention, were interviewed. Interviews were audio-recorded and transcribed. Two investigators undertook coding and analysis using a thematic approach.

#### Results:

Six themes arose from both patients and physiotherapists. Structure: i) technology (easy to use, variable quality, set-up assistance helpful) and ii) patient convenience (time efficient, flexible, increased access). Process: iii) empowerment to self-manage (facilitated by home environment and therapists focusing on effective treatment) and iv) positive therapeutic relationships (personal undivided attention from therapists, supportive friendly interactions). Outcomes: v) satisfaction with care (satisfying, enjoyable, patients would recommend, therapists felt Skype™ more useful as adjunct to usual practice) and vi) patient benefits (reduced pain, improved function, improved confidence and self-efficacy). A seventh theme arose from physiotherapists: vii) adjusting routine treatment (need to modify habits, discomfort without "hands-on", supported by research environment).

#### Conclusion/Key Practice Points:

- Users described mostly positive experiences with Skype™ as a service delivery model. Such a model is feasible and acceptable, and has potential to increase access to supervised exercise management for people with knee OA, either individually or in combination with traditional 'in-clinic' visits.

Trial Registration: ACTRN 12614000243617

## REHABILITATION GROWTH CURVES OF KNEE RANGE OF MOTION, QUADRICEPS STRENGTH, AND GAIT SPEED AFTER TOTAL KNEE ARTHROPLASTY

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MPA10C, Meeting Room C4.10, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

Our study aimed to describe the time course of knee flexion range-of-motion, quadriceps strength, and fast gait speed post total knee arthroplasty (TKA) using quantile growth curves. To facilitate routine outcome assessment in clinical practice, our secondary aim was to develop an app that would potentially reduce the time burden of results analysis and interpretation.

### Design:

Longitudinal follow-up

### Method:

A total of 2,666 patients (mean age, 67years; 74% women) undergoing primary TKA participated. At 4-, 8-, 12-, and 16-weeks post surgery, knee flexion range-of-motion, quadriceps strength, and fast gait speed were quantified. Quantile regression was used to determine the percentiles of the knee and gait measures. To avoid assuming linear time trends, actual assessment dates were used and time was modelled flexibly as a restricted cubic spline.

### Results:

The various knee and gait measures improved nonlinearly over time, with substantial improvements observed in the first 8 to 10 weeks post surgery. Sex-specific growth curves were developed to show the recovery patterns at multiple percentile levels. A web interface was created to facilitate easy computation of the percentile rank for a given outcome value (<https://sgh-physio.shinyapps.io/atomic/>).

### Conclusion/Key Practice Points:

- We have provided population-based, sex-specific percentile values for knee flexion range-of-motion, quadriceps strength, and gait speed recovery post TKA
- The growth curves and web-based app developed from this study could (i) further the understanding of the deviations from the average recovery course, (ii) foster patient communication and engagement with rehabilitation, and (iii) facilitate outcome assessment in the busy clinical setting.

## EFFECTIVENESS OF A PRAGMATIC WEEKEND PHYSIOTHERAPY SERVICE ON SHORT-TERM PATIENT AND HOSPITAL OUTCOMES FOLLOWING TOTAL HIP AND KNEE REPLACEMENT

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MPA10C, Meeting Room C4.10, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

To investigate the effect of a pragmatic acute weekend physiotherapy service on short-term outcomes following hip and knee replacement surgery.

### Design:

Pre-post quasi-experimental study nested within a larger stepped-wedge clustered randomised controlled trial.

### Method:

Consecutive patients undergoing elective total hip and knee replacement at a public tertiary hospital in Melbourne, Australia were approached for consent. Intervention included six-months of existing acute weekend physiotherapy services (phase 1) followed by six-months when these services were discontinued (phase 2). Outcome measures included mobility, functional independence, quality of life and pain (at four

days postoperatively) and acute hospital length of stay and adverse events. Data were analysed according to intention-to-treat and as-treated principles and adjusted for covariates.

#### Results:

One hundred and thirty and 146 participants were allocated to phase 1 and 2 respectively according to surgery date. Eighty-seven participants received weekend physiotherapy services compared to 189 who did not. Length of stay was longer amongst participants who received acute weekend physiotherapy [coefficient (95% CI): 1.39 (0.60 to 2.19),  $p = 0.001$ ] and to a lesser extent amongst participants hospitalised when this service was available [1.003 (0.11 to 1.89),  $p = 0.02$ ]. In contrast, availability of weekend physiotherapy was associated with improved mobility that remained significant after adjustment for the longer length of stay [5.57 (2.80 to 8.34),  $p < 0.001$ ].

#### Conclusion/Key Practice Points:

- The pragmatic weekend physiotherapy service at this location appears to have been counterproductive with respect to length of stay but may have had a small beneficial effect on mobility.

### ROBOTIC VERSUS CONVENTIONAL KNEE ARTHROPLASTY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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MPA10C, Meeting Room C4.10, October 21, 2017, 11:40 AM - 12:40 PM

#### Aim:

To examine differences between robotic and conventional knee arthroplasty on patient self-reported outcomes.

#### Design:

Systematic review with meta-analysis.

#### Methods:

Comparative studies were searched using electronic databases (Medline, Pubmed, Embase and CENTRAL) and grey literature till 16th March, 2017. Studies investigating the effectiveness of robotic knee arthroplasty (active or semi-active) compared to conventional knee arthroplasty were included. Outcomes included post-operative measures of function (Western Ontario and McMaster Universities Arthritis Index (WOMAC), Knee-Society Score (KSS-Function), Hospital of Special Surgery Score (HSS), Oxford Knee), and quality of life (Short Form-36 (SF-36)). Methodological quality was assessed using the Downs & Black checklist and quality of evidence was assessed using the GRADE approach. A random-effects model was used for meta-analysis.

#### Results:

Of the 1821 articles screened, six studies (five reporting active and one semi active) involving 262 participants were included. The methodological quality of the included studies ranged from fair to excellent. The meta-analysis provided low to very-low evidence of no effect between robotic and conventional knee arthroplasty at long-term, WOMAC (MD: -1.61; 95%CI: -3.75 to 0.54), KSS-Function (MD: -0.73; 95%CI: -2.87 to 1.41), HSS (MD: -0.69; 95%CI: -2.49 to 1.11). Single studies reported non-significant differences on all function and quality of life scores.

#### Conclusions/Key Practice Points:

- There is limited low quality evidence suggesting that robotic knee arthroplasty is comparable to conventional knee arthroplasty in terms of patient self-reported outcomes at short and long term.
- These results warrant the need for more and larger randomised controlled trials in this potentially important and evolving area.

## GREATER PRE-OPERATIVE FUNCTION PRIOR TO THE SECOND SURGERY FOR PATIENTS WHO PROGRESS TO BILATERAL KNEE REPLACEMENT

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MPA10C, Meeting Room C4.10, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

The primary aim of this study was to investigate whether patients who progress to bilateral knee replacement are less disabled immediately prior to their second surgery than prior to their first. A secondary aim was to compare outcomes at 12 months between the first and second surgeries, relative to a control population with unilateral knee replacement.

### Method:

101 participants who received bilateral knee replacements at least six months apart, and 438 participants who received a single unilateral knee replacement over a five year period were recruited for this study. All participants were assessed immediately prior to, and 12 months following each surgery on the Oxford-12 which is a measure of self-reported function, and the Knee Society Knee Score which incorporates the surgeon's assessment. Walking speed over six metres was assessed only at post-operative assessment.

### Results:

Prior to the second knee replacement, patients reported significantly greater function on both the Oxford-12 ( $p < 0.001$ ) and the Knee Society Knee Score ( $p = 0.008$ ) than prior to their first knee replacement. Following the second knee replacement, Knee Society Scores were greater ( $p = 0.021$ ) and patients walked faster ( $0 < 0.001$ ) than following the first surgery. There were no differences in pre-operative and post-operative of either surgery compared with the control group.

### Discussion:

Patients experience less functional limitations prior to a second knee replacement than the first. Surgery to replace the contralateral knee is therefore being sought earlier and prior to significant functional decline. Longer follow-up is needed to evaluate whether benefits of the second knee replacement are maintained.

## THREE DAYS OF MONITORING IS SUFFICIENT TO ACCURATELY MEASURE PHYSICAL ACTIVITY LEVELS IN STROKE SURVIVORS: EVIDENCE BASED GUIDELINES

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NNG/GPA10B, Meeting Room C4.9, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

For measurement of physical activity after stroke, we aimed to determine (a) changes in activity in response to wearing a monitor (reactivity), (b) minimum wear time for accurate measurement, and (c) differences between activity levels between weekend and weekdays.

### Design:

Exploratory, secondary analyses of cross-sectional data.

### Method:

In 32 people (> six months post-stroke, independently ambulant), activity was measured over seven days using the activPAL3 (sitting, standing, stepping time and step count) and the Actigraph GT3X+ (light physical

activity and moderate-to-vigorous physical activity). Repeated-measures analyses of variance were used to assess reactivity. Minimum wear time was assessed using regression analyses and median absolute differences (criterion measure 7-day mean values). Paired t-tests were used to assess difference between weekend and weekday activity levels.

#### Results:

There was little evidence of reactivity for any activity variable. Minimum wear time (for  $r^2 \geq 0.9$  and median absolute differences  $<10\%$ ) was three days for all activity variables, with the exception of moderate-to-vigorous physical activity, for which seven days of monitoring was required. There were no significant differences in weekend and weekday activity levels.

#### Conclusions/Key Practice Points:

- In independently ambulant stroke survivors living in the community, three days of activity monitoring is sufficient for accurate measurement of most physical activity variables.
- This is regardless of whether days are sequential (due to shorter monitoring period) or non-sequential (missing data).
- These findings may reduce participant burden in data collection and provide evidence to guide researchers in their management of activity monitor data.

### BIOFEEDBACK IMPROVES PERFORMANCE IN LOWER LIMB ACTIVITIES MORE THAN USUAL THERAPY IN PEOPLE FOLLOWING STROKE: A SYSTEMATIC REVIEW

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#### Aim:

To determine if biofeedback during the practice of lower limb activities after stroke more effective than usual therapy in improving those activities, and are any benefits maintained beyond the intervention?

#### Design:

Systematic review with meta-analysis of randomised trials with a PEDro score  $> 4$ .

#### Method:

Participants were people who have had a stroke (any level of disability and any time after stroke). The intervention was biofeedback (any type delivered by any signal or sense) delivered concurrently during practice of sitting, standing up, standing or walking compared with the same amount of practice without biofeedback. Outcomes were measures of activity congruent with the activity trained.

#### Results:

Eighteen trials including 429 participants met the inclusion criteria. The quality of the included trials was moderately high, with a mean PEDro score of 6.2 out of 10. The pooled effect size was calculated as a standardised mean difference (SMD) because different outcome measures were used. Biofeedback improved performance of activities more than usual therapy (SMD 0.50, 95% CI 0.30 to 0.70) in the short-term. The long-term effect could not be determined.

#### Conclusion/Key Practice Points:

- Biofeedback is more effective than usual therapy in improving performance of activities. Further research is required to determine the long-term effect on learning.
- Given that many biofeedback machines are relatively inexpensive, biofeedback could be utilised widely in clinical practice.

## BRAIN CONNECTIVITY PREDICTS CAPACITY FOR MOTOR LEARNING AND NEUROPLASTICITY IN STROKE: AVENUES TO IMPROVE NEUROREHABILITATION PRACTICE

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### Aim:

Determine whether cortical connectivity can predict motor learning and neuroplasticity induction following stroke.

### Design:

Two randomised, sham-controlled, participant blind, cross-over experiments were conducted.

### Method:

Experiment one investigated whether connectivity could predict change in motor learning on a grip-lift task following an experimental lesion in 18 healthy adults. Stroke was modelled using brain stimulation to suppress cortical excitability. Experiment two investigated whether connectivity could predict experimental neuroplasticity responses. A facilitatory brain stimulation protocol (anodal transcranial direct current stimulation, 20min, 1mA) was applied to the lesioned motor cortex in 10 people with stroke (>6 months post stroke). An increase in cortical excitability, measured with transcranial magnetic stimulation, was used as a marker of neuroplastic induction. For both experiments, resting state cortical connectivity was investigated using electroencephalography.

### Results:

In experiment one, connectivity between the targeted parietal and frontal cortices predicted 71% (cross validated  $R^2=0.66$ ,  $p=0.04$ ) of change in motor learning for real stimulation, but not sham ( $p=0.32$ ). Stronger baseline connectivity resulted in faster motor learning. In experiment two, connectivity between the lesioned motor cortex and parietal cortex predicted 75% (cross validated  $R^2=0.70$ ,  $p=0.03$ ) of variance in neuroplasticity response. Stronger baseline connectivity was associated with a greater facilitation of cortical excitability. This relationship was not evident for sham stimulation ( $p=0.46$ ).

### Conclusion/Key Practice Points:

- Optimal connectivity profiles predicted stronger motor learning and neuroplasticity responses.
- Markers of brain connectivity obtained with commonly available neurophysiological equipment may be appropriate to assist physiotherapy rehabilitation approaches and selection of patients for novel brain-based interventions such as brain stimulation.

## CIRCUIT CLASS THERAPY IMPROVES WALKING ABILITY AND MAY REDUCE LENGTH OF STAY AFTER STROKE. AN UPATED COCHRANE REVIEW

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### Aim:

To examine the effectiveness and safety of circuit class therapy on mobility in people with stroke.

### Design:

Cochrane systematic review and meta-analysis.

### Method:

We followed Cochrane methodology, including randomised controlled trials of adult stroke survivors receiving task-specific group circuit class therapy compared to no, or other therapy.

#### Results:

We included 17 trials (n=1297 participants). Circuit class therapy was superior to other interventions for walking capacity (six minute walk test mean difference 60.9 m, 95% CI 44.6 to 77.2), walking speed (mean difference 0.15 m/s, 95% CI 0.10 to 0.19), self-reported physical function (Stroke Impact Scale mean difference 2.9 points, 95% CI 0 to 5.8), fitness (maximum oxygen consumption mean difference 2.8 ml/kg/min, 95% CI 0.9 to 4.7) and steps per day (mean difference 1325 steps, 95% CI 411 to 2240). Based on two trials, there was a shorter, non-significant reduction in length of stay in favour of circuit class therapy, but this difference did not reach significance (mean difference -16.4 days 95% CI -37.7 to 5.0). The improvements in walking capacity were consistent for trials including participants both early and later after stroke.

#### Conclusions/Key Practice Points:

- There is moderately strong evidence that circuit class therapy improves walking ability after stroke. This finding holds true across clinic-based measures, self-reported ability and daily physical activity.
- Positive findings for walking capacity, speed and fitness were clinically important as well as statistically significant.
- Circuit class therapy may reduce length of rehabilitation hospital stay, which has the potential for cost-savings.

#### FEASIBILITY OF PHYSIOTHERAPISTS DELIVERING A HIGH INTENSITY TREADMILL TRAINING AND SELF-MANAGEMENT PROGRAM TO PEOPLE WITH STROKE UNDERGOING REHABILITATION

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NNG10A, Meeting Room C4.7, October 21, 2017, 11:40 AM - 12:40 PM

#### Aim:

To determine the feasibility and effect on walking of a high-intensity treadmill and self-management program delivered to stroke survivors undergoing inpatient rehabilitation by clinical physiotherapists.

#### Design:

Pre-post trial conducted across two hospital sites in Brisbane, Australia.

#### Method:

Stroke survivors undergoing inpatient rehabilitation who could walk participated in a high-intensity treadmill and self-management program for up to 30 minutes, three times a week for eight weeks with their usual physiotherapist. Feasibility outcomes included participation, compliance, adverse events and satisfaction. Outcomes included physical activity (steps/day measured via ActivPAL), walking speed (over 10m) and endurance (distance over six minutes), and cardiorespiratory fitness (VO<sub>2</sub> Peak) collected at week-0 (pre), week-8 (post) and week-26 (follow up).

#### Results:

Forty stroke survivors completed 106 sessions, 94% at the specified training intensity, with high levels of satisfaction and no adverse events. Post training there was a significant increase in physical activity (mean difference 2,709 steps/day, 95% CI 933 to 4564), walking speed (mean difference 0.24 m/s, 95% CI 0.05 to 0.42), endurance (mean difference 110m, 95% CI 23 to 196), and cardiorespiratory fitness (mean difference VO<sub>2</sub> Peak 0.29ml/kg/min, 95% CI 0.03 to 0.56) compared to pre training. All changes were sustained at week-26.

#### Conclusions:

It is feasible for clinical physiotherapists to implement a high-intensity treadmill training program embedded within a self management approach for people with stroke during inpatient rehabilitation. Sustained clinical improvements suggest that a randomized controlled trial is warranted to compare this approach to usual care.

## BARRIERS AND FACILITATORS TO COMMUNITY AMBULATION RECOVERY FOLLOWING STROKE – PERCEPTIONS OF STROKE SURVIVORS AND THERAPISTS

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### Aim:

To a) identify perceptions of stroke survivors and their treating therapists on community ambulation, as well as encountered barriers and facilitators across the first six months following hospital discharge and b) determine any differences in perceptions between these groups.

### Design:

Qualitative focus groups.

### Method:

Eighteen stroke survivors (age: 70±14 years, 78% male) attended one of five focus groups at 6-months following hospital discharge to discuss their perceptions of community ambulation, recovery over the first 6-months of returning home and barriers and facilitators encountered. Twenty therapists (9±6 years of clinical experience) attended one of three focus groups to discuss the same topics. Focus groups were facilitated by an independent physiotherapist and transcribed verbatim. Template analysis was used to identify themes for each participant group.

### Results:

Both participant groups identified that community ambulation was important, and discussed barriers within the physical environment and post-stroke physical ability. While both participant groups reported therapy and social supports as a facilitator of community ambulation, their perceptions of the role and ideal timing of supports differed. Similarly, both groups discussed internal drive as an important facilitator, but each reported different mechanisms by which this improved community ambulation. Stroke survivors and therapists perceived themselves as pivotal in leading recovery of community ambulation in the first 6-months post-discharge.

### Conclusion/Key Practice Points:

- Therapists and stroke survivors identify similar barriers to community ambulation.
- Future clinical and research practice should explore strategies to improve therapist understanding of facilitators, and early time course of community ambulation recovery following stroke.

## RELATIONSHIP BETWEEN WALKING CADENCE, INTENSITY AND CHARACTERISTICS IN PEOPLE WITH MILD-MODERATE PARKINSON'S DISEASE

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### Aim:

To investigate relationships between walking cadence, activity intensity, and characteristics in people with Parkinson's disease.

### Design:

Cross-sectional observational study

### Methods:

Thirty-three people with mild-moderate Parkinson's disease performed six, two-minute indoor walks at their self-selected walking pace, and at target cadences of 60, 80, 100, 120 and 140 beats/minute. A 500 metre outdoor walk with terrain challenges was also performed. Cadence was measured using accelerometry

(ActivPAL). Intensity was recorded by a portable breath-by-breath gas analyser (oxygen consumption), heart rate and the Borg scale.

#### Results:

Measures of activity intensity incrementally increased as walking cadence increased from 60 to 140 steps/minute ( $p < 0.001$ ), with cadence associated with oxygen consumption ( $ICC = 0.23$ ,  $p = 0.047$ ) and heart rate ( $ICC = 0.47$ ,  $p < 0.001$ ). Oxygen consumption ( $p < 0.001$ ), heart rate ( $p = 0.013$ ) and perceived exertion ( $p < 0.001$ ) were higher during outdoor than indoor walking. Oxygen consumption when walking outdoors was correlated with self-reported physical activity levels ( $r = 0.475$ ,  $p = 0.006$ ), step length and speed over 7m ( $r = 0.363$  to  $0.428$ ,  $p < 0.041$ ), age ( $r = -0.353$ ,  $p = 0.047$ ) and percent body fat ( $r = -0.433$ ,  $p = 0.013$ ). It was not correlated with disease duration or severity.

#### Conclusions:

Cadence may be used to reflect activity intensity in people with mild-moderate Parkinson's disease. Cadence-based activity intensity cut points could be investigated in this population. Several participant characteristics associated with oxygen consumption are modifiable, thus could be addressed to reduce energy costs of walking.

### DO CLINICAL TESTS OF SPASTICITY ACCURATELY REFLECT MUSCLE FUNCTION DURING WALKING: A SYSTEMATIC REVIEW

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#### Aim:

To establish the ecological validity of clinical tests of lower limb spasticity by determining whether the range of motion and speed of movement during assessment accurately replicates muscle function and joint biomechanics during walking.

#### Design:

Systematic review.

#### Methods:

An electronic search of ten databases was performed. Article identification, data extraction and quality assessment were performed by two independent reviewers. Studies included investigated the relationship between assessment findings based on changes to testing velocity or joint range of motion and included a clinical measure of spasticity. The range of motion and velocity of lower limb movements during the stage of the gait cycle where spasticity is likely to be triggered was provided for the hamstrings, quadriceps, gastrocnemius and soleus. The range of motion and speed of testing in the studies were compared to these criteria to establish the presence of ecological validity.

#### Results:

Seventeen studies were included. The Modified Ashworth scale was the most commonly used measure. No study reported the exact range of motion tested. Only one study provided the angular velocity used during clinical testing. A meta-analysis was not appropriate due to the heterogeneity of the study designs.

#### Conclusion/Key Practice Points:

- The ecological validity of the clinical scales of spasticity could not be determined due to inadequate reporting of testing procedures
- Studies need to report testing protocols to better evaluate the impact of spasticity on walking
- Further research into the ecological validity of clinical scales of spasticity is required to understand the impact that spasticity has on walking.

## GROSS MOTOR SKILLS AND FETAL ALCOHOL SPECTRUM DISORDER: TRANSLATING KNOWLEDGE INTO CLINICAL PRACTICE.

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### Aim:

To determine the gross motor (GM) performance of children living in very remote Aboriginal communities. The relationship between GM skills, prenatal alcohol exposure (PAE) and fetal alcohol spectrum disorders (FASD) was explored. This PhD work was part of the Lililwan Project, Australia's first population based study conducted in 2011 investigating the prevalence of FASD in the Fitzroy Valley, north Western Australia.

### Design:

This presentation is a summary of the authors' PhD findings related to the above aim and includes a systematic review, a reliability study, and three observational studies. GM skill assessment within FASD diagnostic guidelines, standardized assessment tool selection, cut-offs to determine impairment, the affected GM skill profile and strategies to optimise child development will be discussed.

### Method:

The key observational study investigated the GM performance in children in the Lililwan Project cohort using the Bruininks–Oseretsky Test of Motor Proficiency (BOT-2).

### Results:

Total of 108 children (98.1% Aboriginal; 53% male, mean age: 8.7 years) were assessed. Half (52.2%) were exposed to at least 'risky' levels of PAE, and 21 (19%) were diagnosed with an FASD. The mean GM composite score of the cohort ( $47.0 \pm 8.4$ ) approached the BOT-2 normative mean ( $50.0 \pm 10$ ) and was similar between children with and without PAE ( $P=0.27$ ). This mean score, however, was significantly lower in children with FASD than without (mean difference:  $-5.5 \pm 20.6$ ;  $P=0.006$ ) and a higher proportion than expected had overall GM impairment ( $\leq 2$  SD: 9.5%;  $\leq 1$  SD: 23.8%). In groups with PAE, no PAE and no FASD, GM function approached expected population norms.

### Conclusions/Key Practice Points:

- Almost 10% of children with FASD had significant GM impairment which is consistent with the known neurotoxic effect of PAE.
- Evaluation of GM performance should routinely be included in FASD assessment to document impairment and enable targeted early intervention.

## FUNCTIONAL PERFORMANCE OF CHILDREN FOLLOWING LOWER LIMB BURN INJURY: A CROSS SECTIONAL STUDY

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### Aim:

To assess the functional performance of children post lower limb burn injury and to determine if burn location affects performance.

### Design:

Cross-sectional study

### Methods:

Total body surface area and burn location were recorded. The six minute walk test and 30 second sit to stand test were used to measure functional performance. The BOT-2 balance subsection and the star excursion balance test assessed balance. Results were compared to normative data using unpaired t-tests, and paired t-tests were used to compare children with different burn locations.

### Results:

Twenty four participants were assessed at a mean 126 days post burn. Total body surface area of the burns ranged from 0.7% to 30% (median 4%) with 8 participants having bilateral burns. Ten participants had burn injuries crossing 12 lower limb joints. Post burn injury, functional performance was significantly reduced on the 30 second sit to stand test (mean difference -5.75 repetitions, 95%CI -8.25 to -3.25) and the six minute walk test (mean difference -87.71 metres, 95%CI -143.23 to -32.17) in comparison to normative data. Balance skills were unaffected with no significant difference on the star excursion balance test (mean difference 2.78% leg length, 95%CI -11.63 to 17.19) and 21 participants scoring in the average or above average category on the BOT-2 balance subscale. Burn location did not significantly alter performance.

### Conclusion:

Functional performance, but not balance, is reduced in children 3- 6 months post lower limb burn injury regardless of burn location. Physiotherapists should consider focusing treatment on reconditioning to address these limitations.

## LONGITUDINAL FIBULAR DEFICIENCY: A CROSS-SECTIONAL STUDY COMPARING LOWER LIMB FUNCTION AND QUALITY OF LIFE OF CHILDREN WITH UNAFFECTED PEERS

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### Aim:

To compare the lower limb function and quality of life of children and young people with longitudinal fibular deficiency to that of unaffected peers.

### Design:

A cross-sectional study of children and young people with longitudinal fibular deficiency aged 7 - 21 years living in New South Wales, Australia.

### Method:

Seventeen (10 males) of an eligible 25 (68%) children and young people completed the 'Knee injury and Osteoarthritis Outcome Score' (KOOS/KOOS-Child) and the 'Cumberland Ankle Instability Tool' (CAIT/CAIT-Youth) validated questionnaires, and were compared to data from 213 unaffected peers. Linear regression models compared affected children and young people to unaffected peers.

#### Results:

Affected participants on average reported lower knee and ankle function and quality of life than unaffected peers (all  $p \leq 0.001$ ). Age significantly affected the difference in all five KOOS domain scores with younger children with longitudinal fibular deficiency having a greater difference to their unaffected peers (all  $p \leq 0.02$ ). Differences in ankle function (CAIT scores) were not affected by age ( $p = 0.26$ ).

#### Conclusion/Key Practice Points:

- Children and young people with longitudinal fibular deficiency reported reduced lower limb function and quality of life when compared to unaffected peers.
- Knee function was worse in younger affected children and closer to normal in older affected children.
- Early assessments and interventions may be beneficial for this patient population.

### THE EFFECT OF 'TRAVELS' IMPAIRMENTS ON GROSS MOTOR FUNCTION AND PARTICIPATION OF SCHOOL-AGED CHILDREN WITH ACHONDROPLASIA

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NPG10A, Meeting Room C4.11, October 21, 2017, 11:40 AM - 12:40 PM

#### Aim:

To determine whether shorter lower limb lengths are related to gross motor limitations or participation restrictions in children with achondroplasia

#### Design:

Population-based, cross-sectional cohort

#### Method:

All Queensland children with achondroplasia aged four to 12 years were invited to participate ( $n=16$ ) and 87.5% were recruited ( $n=14$ ). Authors summarised lower limb impairments using the 'TRAVELS' acronym: i) Trident pelvis, ii) Rhizomelic shortening of femur, iii) Acetabular angle reduction, iv) Varus knee, v) Expanded metaphyses, vi) Long fibula and vii) Short toes. Children were assessed for four clinical TRAVELS impairments (i. thigh length, ii. foot length, iii. toe lengths and iv. tibia-fibula length ratio); gross motor ability (Timed Up and Go (TUG), Timed Up and Down Stairs (TUDS), Forward Reach Test (FRT)); and participation (Functional Independence Measure for Children (WeeFIM-II<sup>TM</sup>)).

#### Results:

All children demonstrated TRAVELS impairments, motor limitations and participation restrictions. Severity of limb shortening was moderately to strongly associated with severity of motor limitations on TUG (all  $r > 0.65$ ,  $p < 0.05$ ) and TUDS (all  $r > 0.56$ ,  $p < 0.05$ ) and participation restrictions on the WeeFIM-II<sup>TM</sup> Mobility Subscale (all  $r > 0.68$ ,  $p < 0.01$ ). Shorter foot and second and third toe lengths were associated with shorter FRT distance (all  $r > 0.57$ ,  $p < 0.05$ ). There were no relationships with fibula-tibia length ratio. Greater participation restrictions (WeeFIM-II<sup>TM</sup> Functional Mobility) were associated with greater motor impairments on all measures (TUG, TUDS and FRT; all  $r > \pm 0.70$ ,  $p < 0.01$ ).

#### Conclusion:

Shorter lower limb lengths predict greater motor limitations and participation restrictions in children with achondroplasia, providing prognostic information to identify children who may require closer surveillance or intervention.

## EXCITING CHANGES IN DRUG MANAGEMENT IN SPINAL MUSCULAR ATROPHY AND IMPLICATIONS FOR PHYSIOTHERAPY

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NPG10B, Meeting Room C4.6, October 21, 2017, 11:40 AM - 12:40 PM

### Background:

Recent advances in drug management of children diagnosed with spinal muscular atrophy (SMA) have altered the natural history of the condition. These advances have significant implications for physiotherapy practice and management and raise questions about how this information can be disseminated to the wider community.

### Aims / objectives:

To enhance participants' knowledge, skills and clinical reasoning in the assessment of floppy babies and children with suspected or known SMA. Information will be provided regarding current outcome measures, the importance of aggressive management of secondary effects of the disease and the time sensitivity of drug treatments. Participants will gain an understanding of the priorities of physiotherapy management in SMA. Participants will be able to identify condition specific red flags and receive guidance regarding when and how to refer on.

### Conclusion / Key Practice Points:

- Participants will be better able to identify children with SMA, including the red flags for SMA type I
- Participants will be aware of outcome measures appropriate for use in individuals diagnosed with SMA
- Participants will understand the relevance of data from clinical outcome measures and how they can affect clinical practice
- Participants will be able to create a treatment and management plan for a child with SMA.

## SIZING THEM UP: HOW TO ASSESS CHILDREN WITH OVERWEIGHT OR OBESITY

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NPG10B, Meeting Room C4.6, October 21, 2017, 11:40 AM - 12:40 PM

### Background:

Physiotherapists have a window of opportunity to positively influence childhood overweight and obesity. However, a recent survey of Australian physiotherapists indicates a need for up-skilling around suitable assessments for this population.

### Aims/objectives:

This session will demonstrate how to undertake and interpret anthropometry assessments used to assess body composition/weight status and cardiorespiratory fitness in children. Other useful assessment tools suitable for this population will also be examined.

### Approach:

This interactive session will use a case scenario to explore suitable assessment tools, before demonstrating selected assessments. Written learning materials will be provided to augment visual demonstrations/videos/slides. The session will complement existing e-learning materials available on the Australian Physiotherapy Association Website.

### Key Practice Points: This session will assist physiotherapists working with children to:

- Feel confident in their assessment and interpretation of weight status in children
- Understand how to apply a simple field-based measure of cardiorespiratory fitness for children
- Enhance their knowledge of other suitable assessments tools for use with overweight or obese children.

## CHARACTERISTICS OF SYMPTOMS EXPERIENCED BY ASYMPTOMATIC INDIVIDUALS WHEN WORKING AT A STANDING WORKSTATION

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OHP10, Meeting Room C3.3, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

The aim of this study was to characterise symptoms experienced by office workers using standing workstations.

### Design:

Cross-sectional observational study.

### Methods:

Eligible participants were office workers aged 18-65 years working >30 hours/week, without previous experience using a sit-stand workstation and without a history of low back pain. Participants stood for 2 hours performing their normal computer-based work at a standing workstation set up according to the Workplace Health and Safety Queensland guidelines. Location, intensity and description of symptoms were recorded every 15 minutes.

### Results:

Sixty-four workers participated in the study. Most (84%) participants experienced symptoms during the 2 hours of working at a standing desk. Similar proportions of people experienced symptoms in the low back (48%), lower extremity (44%) and feet (49%). Neck and upper limb symptoms were experienced by 30% of participants. Time to onset of symptoms varied, with 43% of participants developing a symptom within 30 minutes. The maximal intensity of symptoms ranged from a mean (SD) of 2.3 (1.3) for the low back to 1.3 (0.6) for the upper quadrant on an 11-point numerical rating scale. The most common free-form symptom descriptors were pain and fatigue (66% and 62% of participants, respectively).

### Conclusion/Key Practice Points:

- The present study suggests that office workers should stand for less than 30 minutes at a time to avoid developing symptoms.
- Alternating between sitting and standing postures every 30 minutes may benefit overall health, without incurring concomitant symptoms.

## THE EFFECTIVENESS OF SIT-STAND WORKSTATIONS PLUS EXERCISE TO CHANGE MUSCULOSKELETAL SYMPTOMS IN OFFICE WORKERS: A PILOT TRIAL

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OHP10, Meeting Room C3.3, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

To evaluate the effect of a sit-stand workstation plus resistance exercise (Intervention A) compared with a sit-stand workstation alone (Intervention B) in office workers at risk of developing low back pain (LBP).

### Design:

Two arm pilot randomised trial with concealed allocation, assessor blinding and intention-to-treat analysis.

### Method:

86 office workers (18-65 years) without prior experience using a standing desk and without prior LBP completed a 2-hour standing task. Those identified 'at risk' of developing standing-induced LBP were

randomly allocated to Intervention A (n=16) or Intervention B (n=13). In addition to receiving a sit-stand workstation, participants in Intervention A performed four progressive resistance exercises three times/week during work time for four weeks. Outcomes were severity of LBP (0-10 numerical rating scale) during the standing task and time spent standing and sitting (minutes) at work measured via a thigh-worn activPAL3TM activity monitor. Repeated measures ANOVA was used to determine between group differences.

#### Results:

Twenty-six participants completed the intervention. There was no between group effect for severity of LBP during the 2-hour standing task (SMD (95% CI) = 0(-0.77, 0.77)). Maximum LBP severity reduced similarly following both interventions ( $p < 0.001$ ). Time spent standing and sitting also did not differ between groups (Standing: SMD (95% CI) = -0.23(-1.02, 0.56); Sitting: SMD (95% CI) = 0.33(-0.47, 1.11)). Daily workplace sitting time decreased and standing time increased for both interventions ( $p < 0.001$ ).

#### Conclusion:

Performing progressive resistance exercises does not add to the reduction in standing-induced LBP or increase in standing time with the introduction of a sit-stand workstation.

### PROCESS EVALUATION OF A WORKPLACE-BASED RCT COMPARING SPECIFIC EXERCISE TRAINING WITH GENERAL HEALTH PROMOTION ACROSS 14 ORGANISATIONS: A RE-AIM APPROACH

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OHP10, Meeting Room C3.3, October 21, 2017, 11:40 AM - 12:40 PM

#### Aim:

To document the external validity of a workplace-based cluster-randomised trial comparing an ergonomic plus exercise intervention (EET) with an ergonomic plus health promotion (EHP) intervention using the RE-AIM framework.

#### Design:

Office-based employees (n=763) from 14 organisations were randomly allocated to EET sessions three times per week (n=381) or weekly EHP (n=382) for 12 weeks. Data was collected from individuals through online surveys (baseline, post intervention and monthly to 12 months) and employee profile data collected from organisations. Interventions were conducted in the workplace during work hours.

#### Method:

Data was interrogated to report on the five RE-AIM dimensions (reach, effectiveness, adoption, implementation and maintenance) and 34 criteria, focusing on organisational variances.

#### Results:

Differences between organisations were observed across all RE-AIM dimensions. Main differences were recruitment rates (mean 28.2%, range 7.6% to 77.8%), attrition rates (range 3.1% to 27.1% at 12 weeks; 10.3% to 51.4% at 12 months), degree of communication and engagement (composite measure of leadership, communication and engagement), adherence to and maintenance of interventions. Mean adherence to supervised EET sessions was 58.3% (range 35% to 72.3%) and mean adherence to EHP was 58.2% (range 28.2% to 77.3%). At 12 months, mean percentage of participants regularly maintaining EET was 6.8% (range 0% to 16.7%) and EHP was 33.3% (range 20.8% to 48%).

#### Conclusion:

Adopting a standardised approach is essential for research, however practitioners need to be cognisant that achieving consistent results across organisations may require a tailored approach.

## ALTERED MUSCLE ACTIVATION PATTERNS AMONG INDIVIDUALS OF CHRONIC NECK-SHOULDER PAIN DURING TEXT ENTRY

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OHP10, Meeting Room C3.3, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

To investigate the muscle activation patterns while young adults with chronic neck-shoulder pain performed text entry on a smartphone and a desktop computer.

### Design:

Case-control cross-sectional study

### Methods:

Twenty young adults with chronic neck-shoulder pain and 20 without pain were recruited and allocated into case and control groups. Participants were instructed to perform three text entry tasks: 1) bilateral texting with both thumbs on a smartphone; 2) unilateral texting with the right thumb texting on a smartphone; 3) bimanual typing on a desktop computer. Each task was performed for 10 minutes with 5 minutes rest in between. Activity of left and right proximal muscles: cervical erector spinae, upper trapezius, lower trapezius and distal muscles: extensor carpal radialis, flexor digitorum superficialis, extensor digitorum and abductor pollicis brevis were recorded by surface electromyography during tasks. Median muscle activity of each muscle was analyzed. Furthermore, normalized mutual information (NMI), as an indicator of functional connectivity between muscle pairs, was calculated between left and right homonymous muscle pairs, and between proximal and distal muscle pairs that have synergistic action.

### Results:

Generally, compared with control group, the case group showed consistently higher activity in the upper trapezius and lower NMI among homonymous muscles pairs and among proximal and distal muscles pairs.

### Conclusion/Key Practice Points:

- This study found that young adults with neck-shoulder pain were characterized with heightened muscle activation and decreased connectivity among co-acting muscles when texting and typing.
- This may be associated with the development and persistence of their neck-shoulder pain.

## REAL TIME MODERATION OF PHYSIOTHERAPY PRACTICAL EXAMINATIONS: AN OPPORTUNITY FOR PEER REVIEW AND QUALITY IMPROVEMENT

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R5-10, Meeting Room C4.2, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

To trial and evaluate real-time cross-campus moderation of practical examinations in the Physiotherapy program at Charles Sturt University

### Design:

Qualitative case study using semi structured interviews

### Method:

Real-time moderation of practical examinations was undertaken via videoconference for 10% of the student cohort. Assessors on each campus assessed three students with the assessor on the other campus observing and marking in real-time via Skype. After each student, the assessors compared and discussed their marks, with final marks determined via consensus. The observer also provided peer feedback regarding examination processes. The moderation was iterative and discussion and feedback was applied to

subsequent examinations. Evaluation was through student and examiner feedback, and comparison of marks from each campus.

#### Results:

Students involved reported the process was not obtrusive. The examiners relished the real-time feedback and peer review; but reported additional challenges in managing multiple tasks concurrently.

A small difference between campuses was found in the spread of marks, consistent with historic performance between campuses. The real time moderation only added five minutes per student to the examination process. The simple and cost-efficient video-conference platform had minor limitations in sound/picture quality, variable internet connections and availability.

The process led to improvements and modification of the marking rubric for future examinations, identification of targeted areas in subject design and delivery for development and a welcome opportunity for professional development.

#### Conclusion/Key Practice Points:

- Real-time moderation was a simple and effective approach to practical examination quality assurance, and provided additional benefits in providing opportunity for assessor peer review.

### ASSOCIATIONS BETWEEN NECK KINEMATICS AND PAIN IN INDIVIDUALS WITH CHRONIC IDIOPATHIC NECK PAIN

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R5-10, Meeting Room C4.2, October 21, 2017, 11:40 AM - 12:40 PM

#### Aim:

To determine associations between kinematics and chronic idiopathic neck pain intensity.

#### Design:

Longitudinal cohort study.

#### Method:

Three-dimensional motion capture quantified kinematics in 10 individuals with chronic idiopathic neck pain performing overhead reach to the right and putting on a seatbelt at baseline, 6 weeks and 6 months.

Kinematic variables included maximum joint angle (°), time to maximum (% movement phase), total range of motion (°) and velocity (m/s) for head segment relative to neck (HN) and head/neck segment relative to thoracic (HNT). Visual analogue scale quantified pain at each time point. Mixed regression models determined associations between pain and kinematic variables both over time, and cross-sectionally at each time point.

#### Results:

Higher pain associated with less maximum HN rotation at baseline (reach:  $\beta = -0.32^\circ$ , 95% CI -0.13 to -0.52,  $p = 0.003$ ; seatbelt:  $\beta = -0.52^\circ$ , 95% CI -0.30 to -0.72,  $p < 0.001$ ), and less HN total rotation range of motion at baseline (seatbelt:  $\beta = -0.29^\circ$ , 95% CI 0.10 to -0.49,  $p = 0.006$ ) and 6 months (reach:  $\beta = -0.19^\circ$ , 95% CI -0.38 to -0.002,  $p = 0.048$ ). Higher pain associated with delayed timing to reach maximum HNT rotation over time (reach:  $\beta = .46\%$ , 95% CI 0.099 to 0.82,  $p = 0.015$ ). Pain not associated with other kinematic variables.

#### Conclusion/Key Practice Points:

- Higher neck pain associated with lower maximum and total rotation during functional tasks requiring cervical rotation.
- Supports clinical observation of altered movement strategies in individuals with chronic idiopathic neck pain.

## REBOOT ONLINE: IS AN ONLINE MULTIDISCIPLINARY PAIN MANAGEMENT PROGRAM EFFECTIVE IN CHRONIC PAIN – A RANDOMISED CONTROL TRIAL

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R5-10, Meeting Room C4.2, October 21, 2017, 11:40 AM - 12:40 PM

Multidisciplinary pain programs offer the most effective approach to chronic pain. Attendance to such programs can be limited due to family/work commitments and/or location of residence such as rural patients. Existing online pain management programs have been shown to result in positive outcomes however mainly focus on CBT components and have little or no activity based modules

**Aim:** To evaluate the effectiveness of "Reboot online" within a randomised controlled trial of the program.

**Method:** Eighty participants who had self-reported chronic pain were enrolled into the trial and were randomly allocated to one of two study arms (1. Reboot online N=39, 2. Usual care N=41). Primary outcome measures included: BPI, PSEQ, FABQ, TAMP, PCS, CPAQ, PHQ9 and K-10. Measures were collected at pre-treatment, post treatment and 3 month follow up time points.

**Results:** The intervention group showed significant change in measures of pain interference ( $P<0.001$ ), pain related stress ( $P<0.0001$ ), pain self-efficacy ( $P<0.001$ ), fear avoidance beliefs ( $p<0.0001$ ), kinesiophobia ( $P<0.0001$ ), chronic pain acceptance ( $P<0.0001$ ), depression ( $P<0.0001$ ) and general distress ( $P<0.0001$ ) in pre to post treatment measures, with improvements maintained up to 3 months

**Conclusion:** Reboot online is a promising and effective approach offering a unique online multidisciplinary pain management program. Reboot Online offers a cost-effective adjunct to multidisciplinary face-to-face pain management programs; "Reboot online" will provide access to a MDPP for those living in rural areas, those unable to attend a program onsite due to physical/psychological impairment or with family/work commitments, thus increasing the accessibility to health services for those in chronic pain.

## A COMPARISON OF PATIENT EDUCATION PRACTICES OF NOVICE AND EXPERIENCED PHYSIOTHERAPISTS IN AUSTRALIAN SETTINGS

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R5-10, Meeting Room C4.2, October 21, 2017, 11:40 AM - 12:40 PM

**Aim:**

To compare the patient education practice of experienced and novice physiotherapists and their perceptions of the importance of these practices.

**Design and Methods:**

A web-based purpose-designed survey was developed, piloted and administered to practicing physiotherapists through direct email. Of 305 complete responses, two subgroups were explored for comparative analysis: 'novice' ( $\leq 5$  years' experience,  $n=52$ ); and 'experienced' ( $\geq 11$  years' experience,  $n=204$ ).

**Results:**

The experienced group rated 14 of 15 educational items higher than the novice group in relation to frequency of use and perceived importance. Experienced physiotherapists reported a significantly higher frequency of using one-to-one discussion, personalised handouts and explicitly seeking patient understanding ( $p<0.05$ ). Novice physiotherapists perceived more barriers to patient education, particularly those related to characteristics of the patient ( $p<0.05$ ).

**Conclusion/Key Practice Points:**

- Experienced physiotherapists report higher use of self-management education and education content that is patient-centred.

- Experienced therapists report a higher frequency of seeking explicit patient understanding to evaluate their teaching than novice physiotherapists and perceive fewer patient-related barriers to their practice.
- Students or novice physiotherapists may benefit from strategies to facilitate patient-centred education, self-management education, evaluation approaches and strategies to manage barriers.

## THE USE OF MOBILE DEVICES BY UNIVERSITY STAFF AND PHYSIOTHERAPY STUDENTS AND RELATED SYMPTOMS

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R5-10, Meeting Room C4.2, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

To survey staff and Physiotherapy students at an Australian University about their mobile device usage and possibly related symptoms.

### Design:

Observational study.

### Methods:

In total, 200 staff and 100 physiotherapy students were randomly selected and invited to complete a survey about usage of mobile devices such as smartphones, tablets and laptops and musculoskeletal symptoms. Neck pain and headache were the main outcomes.

### Results:

The survey was completed by 105 staff (53%) mean age 46±12 years, 69% female and 93 (93%) physiotherapy students (22±4 years, 59% female). Time spent on desk top computers was 4.9 and 1.5 hours per day respectively; mobile devices was 2.4 and 4.1 hours per day, with 0.6 and 1.9 hours on social media; and 10 and 31 phone texts per day. Headaches were reported by 51% of staff and 66% of physiotherapy students; neck pain 44% and 53%; thumb pain 10% and 23%; fatigue 23% and 55%; concentration difficulties 12% and 42%; checking phone through the night 5% and 8%; anxious if not contactable 22% and 33%; refrain from going out with friends to be on a mobile device 1% and 6%; and have had an accident or fallen over while texting 16% and 40%.

### Conclusions:

Physiotherapy students are spending long periods of time on mobile devices and are reporting high levels of headaches, neck, and thumb pain. They report fatigue, concentration difficulties and stress which they feel may be related to mobile device usage. This may have implications on their working life as physiotherapists.

## GYNAECOLOGY PHYSIOTHERAPY SCREENING CLINICS IMPROVE ACCESS TO CARE AND HEALTH OUTCOMES FOR WOMEN ON GYNAECOLOGY OUTPATIENT WAITING LISTS

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R5-10, Meeting Room C4.2, October 21, 2017, 11:40 AM - 12:40 PM

### Aim:

This study aims to determine if a physiotherapy led gynaecology screening clinic (GPSC) can improve access to care and health outcomes in women with incontinence and/or pelvic organ prolapse (POP) referred for gynaecology/urogynaecology outpatient services (wait-listed as category three).

### Design:

A service evaluation investigating patient outcomes after introduction of GPSC at two hospital sites.

#### Method:

GPSC admission and discharge data were collated on women completing treatment for incontinence and/or POP. Initial assessment was undertaken by the lead physiotherapist. Patients undertook a course of treatment, and were discharged from GPSC with no further treatment required or continued onto gynaecology/urogynaecology review. Percentage of women with clinical improvement and the magnitude of change on clinical outcome measures between initial and discharge were evaluated. Patient satisfaction data was collected. Data was also retrieved from a historical comparator group who attended an initial gynaecology/urogynaecology appointment prior to the implementation of GPSC.

#### Results:

201 female patients average age 52(18-84 years), completed a course of treatment. Of these, over 73% were very satisfied with their outcome, 33% required no gynaecology/urogynaecology appointment. Statistically significant improvements were noted in waiting time prior to the initiation of care (mean 133-87 days), severity of symptoms, and the number of gynaecology/urogynaecology appointments required.

#### Conclusion/Key Practice Points:

- Early physiotherapy intervention prior to gynaecology/urogynaecology appointment for women with incontinence or POP can significantly decrease waiting times for initial care and improve patient outcomes.
- It reduces the demand on the gynaecology/urogynaecology waiting lists and has a high level of patient satisfaction.

### **BARRIERS TO CLINICIAN ADHERENCE TO CLINICAL GUIDELINES FOR LOW BACK PAIN: A SYSTEMATIC REVIEW AND META-SYNTHESIS OF QUALITATIVE STUDIES**

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R5-10, Meeting Room C4.2, October 21, 2017, 11:40 AM - 12:40 PM

#### Background:

Low back pain is the highest ranked condition contributing to years lived with disability and is associated with significant societal and individual cost. Despite consistent evidence-based treatment recommendations for low back pain, management in primary care remains suboptimal with overreliance on imaging and medical intervention.

#### Aim:

To explore what primary care clinicians perceive and believe about clinical practice guidelines for low back pain, including perceived enablers and barriers to guideline adherence.

#### Design:

A systematic review of qualitative studies.

#### Methods:

The study was registered with PROSPERO (CRD42014012961), a protocol was published in BMJ Open and our methods conformed to Cochrane Collaboration guidelines, the PRISMA Statement and the COREQ and ENTREQ Checklists. Eight electronic databases were searched from inception until July 2014. Pairs of reviewers independently screened titles and abstracts, extracted data, appraised method quality using the CASP checklist, conducted thematic analysis and synthesized the results in narrative format.

#### Results:

From a yield of 1880 titles, 17 papers, with a total of 705 participants were included. Three themes were identified: 1) beliefs about the guidelines that influence adherence; 2) maintaining the patient-clinician relationship with imaging and acquiescence to patient demands; 3) barriers such as time, professional

identity and diagnostic uncertainty. Accepted practice amongst their peers can supersede guideline adherence and clinicians defer to patient requests and demands.

Conclusions/Key Practice Points:

- Imaging is over-utilised and advice to stay active is underused.
- Guidelines are viewed as prescriptive and clinicians rely on past experience and clinical judgement rather than evidence-based practice.

## INTERPROFESSIONAL STUDENT OBSERVATION PLACEMENTS: FACILITATING COLLABORATIVE PRACTICE

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R5-10, Meeting Room C4.2, October 21, 2017, 11:40 AM - 12:40 PM

Aim:

To investigate the perceptions and experiences of physiotherapy and nursing students undertaking one-day interprofessional clinical student observation placements.

Design:

Mixed method, utilising pre and post quantitative and qualitative participant survey.

Method:

Physiotherapy and second year nursing students attending Calvary Public Hospital Bruce between June and December 2016 were invited to participate in the project. One-day interprofessional placements were co-ordinated by physiotherapy and nursing student placement co-ordinators and facilitated by senior clinical educators. Qualitative and quantitative feedback was obtained from participating students through pre and post interprofessional day survey.

Results:

32 students experienced an interprofessional day placement during the study period. High survey completion rates were recorded (96% for pre-placement, 84% post-placement). Prior to the interprofessional observation experience, students had minimal exposure to interprofessional learning (23% none, 57% minimal, 20% moderate). 90% of students expected the experience to benefit their learning. 87% of students knew little of the professional role they would be observing. Post placement, 77% of students stated the experience benefited their learning and 85% of students stated the experience would assist their understanding of the other profession's role. Themes from qualitative data also indicated a positive and valuable experience.

Conclusion/Key Practice Points:

The inclusion of interprofessional placements in the clinical training of healthcare workers can successfully provide students with the opportunity to work with other professionals outside their discipline and develop their collaborative skills and understanding. This project was strongly supported by participating students. Future placements will include clinical educator perceptions and experiences.

## 'HOW TO' ASSESS MALADAPTION THROUGH A MULTI-PLANAR SYSTEMS APPROACH TO COORDINATION DYNAMICS ASSESSMENT

**Rath L<sup>2</sup>**

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SPA10A, Meeting Room C4.1, October 21, 2017, 11:40 AM - 12:40 PM

Background:

We move differently in pain (Hodges et al 2011) and the motor adaptations may be (maladaptive (Elbert et al 2001). Pain resolution does not necessarily drive resolution of the motor adaptations that occur (Moseley et al 2006; Tucker et al 2009). Intentional assessment to highlight motor adaptations to pain has not been formally developed. The Multiplanar Systems Approach (MSA) to coordination dynamics assessment and training, is a NEW assessment approach developed in an attempt to intentionally highlight pain motor adaptations that may become clinical targets. This may facilitate full recovery of functional environmental adaptation.

Aims:

Present The Multiplanar Systems Approach (MSA) to Coordination Dynamics Assessment.

Objectives:

- Communicate the benefits of assessing the WHOLE body system
- Define MSA to coordination dynamics
- Present patient observations when employing MSA
- Promote understanding of the role of the clinician to invite the patient (through a clinical learning environment) to adapt out of the motor adaptation to pain (within the constraints of pathology)

Learning outcomes:

- Clearly understand each objective
- Participate in or have knowledge to perform MSA assessment independently

Approach:

- Define MSA, showing pre-recorded patient video
- Presentation: Application of MSA as treatment tool
- Discussion: emerging MSA findings
- Provision of Handout (Rath 2016)

Key Practice Points:

- Clinical integration of a MSA to coordination dynamics assessment provides an assessment extension into the whole body system.
- This may expose secondary system maladaptation.
- Important clinical targets may be identified through this new assessment approach.

## THE ART VS SCIENCE OF LOWER LIMB KINETIC CHAIN REHABILITATION

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SPA10A, Meeting Room C4.1, October 21, 2017, 11:40 AM - 12:40 PM

Background:

Functional assessment and treatment of the lower limb kinetic chain (LLKC) and its role in common hip, knee and ankle pathology is vital in determining an accurate impression and intervention for deficits that may be preventing a return to activity.

Aims:

The session will be a practical and interactive demonstration of exercises that can be taught in the clinic to ensure specific and accurate muscle activation.

Participants of any level of experience will learn and experience how to activate:

- GMax vs GMed
- VMO vs VL
- Hamstrings
- Medial vs lateral calf.
- The primary muscles required for lower limb pathology rehabilitation.

Approach:

Participants will be shown how to:

- Perform practical in clinic functional assessment tasks to determine any dysfunction
- Use subtlety in exercise prescription to gain specific muscle activation.
- Activate and enable co-contraction of the targeted muscle groups of the LLKC by normalising functional anatomic movement patterns during exercise.

There will be a discussion on the limitations of current evidence in the literature.

Participants will be encouraged to continue to utilise their knowledge and observation of normal and abnormal movement patterns associated with pathology to dictate the future direction of the scientific and evidence based research.

Key Practice Points:

- The participant will be able to efficiently and effectively design and implement an appropriate treatment and exercise program to address the fundamental dysfunctions that are contributing to lower limb pathology they encounter in the clinic on a daily basis.

#### **PATELLOFEMORAL PAIN: AN EARLY MANIFESTATION OF PATELLOFEMORAL OSTEOARTHRITIS?**

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SPA10B, Meeting Room C4.4, October 21, 2017, 11:40 AM - 12:40 PM

Patellofemoral pain is a common and burdensome condition across the lifespan, especially in active individuals. Although once considered a benign, self-limiting condition, our work has revealed that patellofemoral pain is often persistent. 40% of people aged 14-40 years report ongoing pain after 12 months, and 57% have persistent pain after 5-8 years – irrespective of whether or not they have had treatment. We have the highest level demonstrating that physiotherapy treatments such as exercise, patellar taping and foot orthoses can improve patellofemoral pain. So why does patellofemoral pain persist in such a large proportion of people? It's thought that patellofemoral pain in young adults may represent the earliest manifestation of patellofemoral osteoarthritis (OA) – an important subgroup of knee OA that is more prevalent than tibiofemoral OA, occurs at a younger age, provokes worse pain and function, and has no cure. Although patellofemoral pain and OA share similar characteristics regarding symptoms, patellar malalignment, biomechanics, and muscle function, there is limited direct evidence supporting this relationship. This presentation will highlight our recent findings of the substantial prevalence of patellofemoral OA in young and middle-aged adults (aged 26-50 years) with chronic patellofemoral pain, and how imaging features of patellofemoral OA relate to symptoms and function. Importantly, it will provide insight and practical strategies for physiotherapists to optimise management of people with patellofemoral pain, and potentially change the natural history of this common, chronic condition.

#### **RUNNING RETRAINING FOR EARLY ONSET OA**

**Barton C**

SPA10B, Meeting Room C4.4, October 21, 2017, 11:40 AM - 12:40 PM

Is running bad for your knees? Probably not.

What about if you have osteoarthritis? We do not really know.

Regardless, running is an inexpensive form of moderate to vigorous physical activity, serving to benefit cardiovascular and mental health. With so many health benefits, it is vital we ensure any (potential) harms are minimised. One great emerging area of research and clinical practice and research here is running retraining, or coaching to improve technique. The biomechanical effects of a number of strategies including step rate (cadence) manipulation and transitioning to a non-rearfoot-strike have been researched extensively, with results valuable when considering the potential value of these strategies for knee osteoarthritis. There are also other running retraining strategies worthy of consideration, but these have less scientific evidence to support their use. The pros and cons of various running retraining strategies for people with early onset knee osteoarthritis will be discussed.

#### **A NEW THERAPEUTIC MODALITY FOR PERSISTENT PELVIC PAIN: A CASE STUDY OF THE USE OF PHOTOBIOMODULATION**

**Diggles A<sup>1</sup>**, Bullock-Saxton J<sup>1</sup>

*<sup>1</sup>Active Rehabilitation Physiotherapy, South Brisbane, Australia*

WMPH10A, Meeting Room C4.3, October 21, 2017, 11:40 AM - 12:40 PM

Aim:

To evaluate the addition of photobiomodulation as part of multi-modal intervention for persistent pelvic pain.

#### Design:

An ABA design single case study with follow-up at 4, 12 and 18 weeks.

#### Method:

A single female patient, aged 34 years with a diagnosis of persistent pelvic pain underwent weekly photobiomodulation in addition to her continuing treatment of education, exercise and manual therapy. The Irradia three diode superpulsed GaAs laser (904nm), average output 60mW and dosages of 0.9J to 3.6J/cm<sup>2</sup> was applied locally to the perineal structures, sacral plexus and lumbar spine; average treatment time was 10 minutes and average dosage 120J per session. Patient rated outcomes included the multi-dimensional pain inventory, a global patient specific functional scale (PSFS), symptom diary and numerical pain rating scale (NPRS). Single-blinded objective assessment included pain sensitivity using a pressure algometer, superficial and digital palpation of pelvic floor structures using the NPRS and modified ashworth scale (MAS).

#### Results:

There was a significant and clinically relevant improvement in pain levels (a >30% improvement at 4 weeks; >50% at 12 weeks), a reduction in analgesic use, 60% improvement in PSFS and improvement in pelvic floor muscle tone (MAS 5/5; at 4 weeks 3/5; at 12 weeks 3/5).

#### Conclusion/Key Practice Points:

- This is the first ever trial of photobiomodulation for persistent pelvic pain
- The therapy was well-tolerated and improvement in pain levels resulted in improved functional state
- Further research and larger trials in the use of photobiomodulation for pelvic pain are warranted

### **PHYSIOTHERAPY MANAGEMENT OF MALE INCONTINENCE AND ERECTILE DYSFUNCTION POST RADICAL PROSTATECTOMY UTILISING TRANSPERINEAL RTUS - A LIVE PATIENT DEMONSTRATION** **Doorbar-baptist S<sup>1</sup>**

<sup>1</sup>*Sydney Mens Health Physiotherapy, Sydney, Australia*

WMPH10B, Meeting Room C4.5, October 21, 2017, 11:40 AM - 12:40 PM

#### Background:

Physiotherapy to retrain pelvic floor muscles has been shown to be highly beneficial in female stress urinary incontinence management but equivocal in the male arena post prostatectomy. This may be due to the fact that men require different training to women in order to more accurately develop the muscles responsible for urethral closure. Transperineal RTUS has been shown to be an emerging technique to more accurately offer high quality biofeedback and should be considered as a first line intervention in order to develop accurate motor patterning.

#### Aims/Objectives:

A live patient demonstration of Transperineal RTUS will be given enabling observation of the effect of various verbal cues on activation patterns within the male pelvic floor.

To discuss the role we can play in optimising penile rehabilitation strategies so that patients can be as informed as possible and take control of their erectile recovery.

#### Approach:

Brief lecture with PowerPoint slides (5 mins)

RTUS connected to projector enabling live demonstration of transperineal RTUS scanning (20 mins) using male model

Open discussion regarding the role of the physiotherapist in penile rehabilitation (5 mins)

#### Conclusion / Key Practice Points:

At the end of this session participants will be able to understand:

- How to use transperineal RTUS to optimise feedback during early pelvic floor muscle motor training.
- How to classify, monitor and target interventions to improve urinary incontinence post prostatectomy
- How to discuss penile rehabilitation with clients to support them during their period of erectile dysfunction

## CHRONIC LUNG DISEASE WITHIN AUSTRALIA - THE BROAD REALITY FOR PHYSIOTHERAPY

**Patman S<sup>1</sup>**

<sup>1</sup>*The University of Notre Dame Australia, Fremantle, Australia*

CRP11A, Meeting Room C3.4, October 21, 2017, 1:45 PM - 2:30 PM

Chronic diseases are the leading cause of ill health and death in Australia. Indigenous Australians, people living outside major cities and in low socioeconomic areas, people with mental illness or disability, and prisoners generally have higher rates of illness, health risk factors and death than other Australians [Australia's health 2016 (AIHW)]. More than 3 in 10 Australians (31% or 7 million people) have one or more chronic respiratory conditions. Improvements in technology and overall enhanced healthcare means there are increasing numbers in our community with chronic lung disease. Whether it be premature infants surviving and growing up with chronic lung conditions (e.g. bronchopulmonary dysplasia), the increasing life expectancy of those with cystic fibrosis, or the ageing population in general, the magnitude and diversity of chronic lung disease in our community is on the rise. The reality for the profession is that on top of the ageing population and surge in non-communicable diseases more broadly that will create ongoing demand for cardiorespiratory physiotherapy services, there is the potential to see more people in our practices with impairments arising from chronic lung disease such as non-CF bronchiectasis, asthma, COPD, bronchiectasis, sleep disordered breathing, obesity hypoventilation, interstitial lung disease, chronic sinusitis, occupational lung diseases, ARDS survivors and critical illness survivors more generally. The prevention, management and treatment of this broad spectrum of chronic respiratory conditions within primary health and acute settings creates opportunities for the profession across research, education, and clinical practice to optimise the health and participation of those with chronic lung disease.

## MANAGING FALL-OUT FROM CHRONIC LUNG DISEASE - THE PHYSIOTHERAPIST'S PERSPECTIVE

**Button B<sup>1</sup>**

<sup>1</sup>*The Alfred Hospital, Melbourne, Australia*

CRP11A, Meeting Room C3.4, October 21, 2017, 1:45 PM - 2:30 PM

Chronic suppurative lung disease is characterised by chronic cough. Coughing results in downward pressure on the pelvic organs and stress incontinence. Women need to be taught 'the knack', a contraction of the pelvic floor prior to coughing and all activities that apply downward pressure on the pelvic floor. Pelvic floor muscle training prevents urinary leakage especially during pulmonary exacerbations. Gastroesophageal reflux (GOR) can result in aspiration of noxious gas or liquid into the lungs and/or reflex bronchospasm. Increased intra-abdominal pressure caused by coughing; head down tilted positions (postural drainage and inverted yoga positions); and inappropriate relaxations of the lower oesophageal sphincter (LOS) all may result in oesophageal inflammation and a vicious cycle favouring pathological GOR. Patients should be taught to do airway clearance therapy (ACT) that minimise GOR and in positions that limit the upward spread of the refluxate. Chronic cough can cause collapsible airways. HiPEP with huffing and coughing into a PEP mask splints airways for effective expectoration. Repeated coughing and GOR may cause vocal cord inflammation and dysfunction which simple vocalisation exercises can control. Cough syncope and consequent injury can follow paroxysms of coughing which lead to high intrathoracic pressures, decreased venous return and reduced cardiac output. Patients need to be taught strategies to avoid paroxysmal coughs. Forceful coughing may result in over use of many muscles causing pain, strain and musculoskeletal pathology including rib fractures. Physiotherapists treating patients with chronic lung diseases require a broad range of cardiorespiratory, women's health and musculoskeletal knowledge and treatment skills to manage patients effectively beyond the lungs.

## CAN FIVE TIMES SIT-TO-STAND TEST PERFORMANCE PREDICT COMMUNITY AMBULATION IN HOSPITALIZED PATIENTS?

**Melo T<sup>1</sup>, Duarte A<sup>2</sup>**

<sup>1</sup>*Universidade Salvador (UNIFACS), Salvador, Brazil, <sup>2</sup>Instituto Sócrates Guanaes, Rio de Janeiro, Brazil*

CRP11B, Meeting Room C3.5, October 21, 2017, 1:45 PM - 2:30 PM

Aim:

The objective of this study was to evaluate the accuracy of the five times sit-to-stand test (FTSST) for predicting community ambulation in hospitalized patients. Sit-to-stand performance is associated with muscle

strength, balance control and risk of falls. However, the ability of this test to predict walking performance has not been investigated previously.

**Design:**

Cross-sectional study, held between July and December 2015 at Teresa Lisieux Hospital, Salvador, Brazil.

**Method:**

83 patients (age  $\geq 18$  years) from a general intensive care unit were assessed at the time of discharge. The predictive variable was the five times sit-to-stand test score, and the outcome of interest was the presence of community ambulation (walking speed ranging from 0.8 to 1.4 m/s). After the descriptive data analyses, the sensitivity, specificity and accuracy of a test using the predictive variable were calculated.

**Results:**

The frequency of community ambulation in the sample was 78.3%, and the mean length of time spent performing the FTSST was  $13.95 \pm 7.46$ s. Patients with time longer than or equal to a cutoff of 10.05s on the FTSST were considered non-community walkers with a sensitivity of 94% and a specificity of 65.4%. The accuracy of this cutoff was excellent (0.91; IC=0.83-0.98;  $p=0.001$ ).

**Conclusion / Key Practice Points:**

- The FTSST was considered to be a predictor of community ambulation in hospitalized patients.

**IT'S NOT THE HEAT IT'S THE HUMIDITY...ACTUALLY IT'S BOTH. ABSOLUTE HUMIDITY LEVELS DELIVERED DURING HIGH-FLOW OXYGEN THERAPY.**

McCormack P<sup>1,2</sup>, **Caruana L**<sup>1,2</sup>, Jarrett P<sup>2</sup>, Corley A<sup>2</sup>, Tronstad O<sup>1,2</sup>

<sup>1</sup>The Physiotherapy Department, The Prince Charles Hospital, Chermside, Australia, <sup>2</sup>The Critical Care Research Group, The Prince Charles Hospital, Chermside, Australia

CRP11B, Meeting Room C3.5, October 21, 2017, 1:45 PM - 2:30 PM

**Introduction:**

Mucociliary clearance is optimised at core body temperature and 100% relative humidity (absolute humidity 44 mg/L). Some ventilators can deliver high-flow oxygen and are portable allowing mobility however they are unable to provide humidification during mobilisation.

**Aim:**

To determine the decrease in absolute humidity during delivery of high-flow oxygen without humidification, and the time taken to return to baseline.

**Design:**

Benchtop Study.

**Method:**

Relative humidity and temperature were measured at the high-flow Tracheostomy Piece at flows of 30L/FiO<sub>2</sub> 30%, 40L/FiO<sub>2</sub> 40%, and 60L/FiO<sub>2</sub> 60%; at baseline, five minutes after ceasing humidification and at five minute intervals after restarting humidification for up to 30 minutes. Absolute humidity was calculated from relative humidity and temperature. A linear regression model determined the difference in means.

**Results:**

Baseline absolute humidity was 40.40 mg/L (SD 0.1), 41.18 mg/L (SD 0.09) & 41.83 mg/L (SD 0.1) at 30L, 40L & 60L respectively. Five minutes after ceasing humidification, absolute humidity was 21.31 mg/L (SD 0.67), 21.69 mg/L (SD 0.09) and 18.67 mg/L (SD 0.1) at 30L, 40L and 60L respectively. Resulting decreases in absolute humidity were 19.09 mg/L ( $p < 0.001$ ), 19.49 mg/L ( $p < 0.001$ ) and 23.16 mg/L ( $p < 0.001$ ) at 30L, 40L and 60L respectively. Baseline absolute humidity was restored after 15 minutes for flows of 30L and 40L but failed to return to baseline after 30 minutes at 60L.

**Conclusion/ Key Practice Points:**

- When delivering high-flow oxygen during mobilisation, humidification should be used to reduce the likelihood of ciliary dysfunction.

## CONNECTING THE SILOS: PHYSIOTHERAPIST LEADERSHIP IN PROMOTING MULTIDISCIPLINARY EVIDENCE-BASED MANAGEMENT OF COMMUNITY-ACQUIRED PNEUMONIA

**Lloyd M**<sup>1,3</sup>, Karunajeewa H<sup>2,4,6</sup>, Janus E<sup>2,4</sup>, Skinner E<sup>1,8,9</sup>, Haines T<sup>8</sup>, Tang C<sup>1,10</sup>, Haines K<sup>1,9</sup>, Lowe S<sup>1</sup>, Shackell M<sup>1</sup>, Karahalios A<sup>5</sup>, Callander E<sup>11</sup>, Ko S<sup>2</sup>, Bali P<sup>2</sup>

<sup>1</sup>Department of Physiotherapy, Western Health, St Albans, Australia, <sup>2</sup>General Internal Medicine Unit, Western Health, St Albans, Australia, <sup>3</sup>North-West Academic Centre, University of Melbourne, St Albans, Australia, <sup>4</sup>Melbourne Medical School - Western Precinct, University of Melbourne, St Albans, Australia, <sup>5</sup>Melbourne School of Population and Global Health, University of Melbourne, Parkville, Australia, <sup>6</sup>The Walter and Eliza Hall Institute of Medical Research, Parkville, Australia, <sup>7</sup>Joseph Epstein Centre for Emergency Medicine Research, Western Health, St Albans, Australia, <sup>8</sup>Department of Physiotherapy, Faculty of Medicine, Nursing and Health Sciences, Monash University, Frankston, Australia, <sup>9</sup>Department of Physiotherapy, Melbourne School of Health Sciences, University of Melbourne, Parkville, Australia, <sup>10</sup>College of Science, Health and Engineering, La Trobe University, Bundoora, Australia, <sup>11</sup>Australian Institute of Tropical Health and Medicine, James Cook University, Townsville, Australia

CRP11B, Meeting Room C3.5, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

To evaluate an alternative physiotherapist-led model of care for community-acquired pneumonia (CAP), designed to improve adherence to levels-1 and -2 evidence-supported interventions (early mobilisation, routine corticosteroids, early switch to oral antibiotics, and routine malnutrition screening).

### Design:

Pragmatic, investigator-initiated, stepped-wedge randomised trial, with waiver of prior informed consent.

### Method:

All patients hospitalised under a General Internal Medical (GIM) unit meeting a standard case-definition for CAP were included. Eight GIM units at two Australian hospitals were randomised using concealed allocation to either: i) usual medical / allied health care delivered according to existing organisational practice, or ii) care supported by a dedicated physiotherapist-led "CAP Service": a multidisciplinary team deploying algorithm-based implementation of four evidence-based interventions. Outcome measures include: i) length of hospital stay, ii) mortality, iii) 30- and 90-day readmission rates, iv) compliance with evidence-based practice, and v) adverse events. Target sample size for the study is 640, with 520 recruited at Week 30 of 50.

### Results:

This trial is recruiting until 31-07-2017. Preliminary results relating to compliance with evidence-based practice and adverse events are expected by September 2017.

### Conclusion:

This study demonstrates an innovative, analytically robust approach to prosecuting translational health services research, where the aim is to improve adherence to treatments already well-supported by existing evidence in a generalisable "real-world" setting. The novel model of care being evaluated places physiotherapists as leaders of a multidisciplinary approach to managing one of the highest burden conditions in our health system.

## DOES CHRONIC RESPIRATORY DISEASE AFFECT DELIVERY OF PHYSIOTHERAPY FOR INTUBATED ADULTS WITH COMMUNITY ACQUIRED PNEUMONIA?

**van der Lee L**<sup>1,2</sup>, Hill A<sup>3</sup>, Patman S<sup>1</sup>

<sup>1</sup>The University of Notre Dame Australia, Fremantle, Australia, <sup>2</sup>Fiona Stanley Hospital, Murdoch, Perth, Australia, <sup>3</sup>Curtin University, Bentley, Perth, Australia

CRP11B, Meeting Room C3.5, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

To explore if chronic respiratory disease influences clinical reasoning when delivering respiratory physiotherapy interventions for intubated patients.

### Design:

Cross-sectional, mixed methods survey.

#### Methods:

Senior intensive care physiotherapists were recruited from 72 Australian hospitals. Respondents were nested within a larger online survey, developed and piloted to explore current clinical practice and clinical reasoning for intubated patients with community acquired pneumonia. Qualitative data were collected using open-ended responses to explore if the presence of underlying chronic respiratory disease would impact on clinical reasoning when planning delivery of respiratory interventions during the acute intubated period. Thematic and content analysis were used to interpret the data. University ethics approval was obtained.

#### Results:

Survey response rate was 72% (n=75), with 83% (n=62) responding to chronic respiratory disease related items. Most respondents indicated that presence of underlying chronic respiratory disease would impact their clinical reasoning (90%, n=56). Variability in clinical reasoning and treatment mode selection was evident, however trends emerged concerning indications and precautions for intervention. Caution with hyperinflation techniques was advocated for chronic obstructive pulmonary disease (77%, n=43), restrictive lung disease (64%, n=36) and suppurative lung disease (11%, n=6). Secretion clearance was reported of greatest concern for underlying suppurative lung disease (48%, n=27) more likely resulting in frequent intervention (34%, n=19) and more targeted use of positioning.

#### Conclusions/Key Practice Points:

- Extra consideration is required when providing respiratory interventions for intubated patients with underlying respiratory disease.
- Pathophysiology is suggested as impacting on need, safety and choice of physiotherapy intervention for intubated patients with pneumonia.

#### CAN ALLIED HEALTH ASSISTANTS (AHA) PROVIDE SAFE CLINICAL INTERVENTIONS IN AN ACUTE CARDIORESPIRATORY PHYSIOTHERAPY SERVICE?

**Hall K<sup>1,4</sup>**, Cobb R<sup>1</sup>, Chambers R<sup>1</sup>, Roll M<sup>2</sup>, Donnelly T<sup>2</sup>, Bell S<sup>3</sup>, Maxwell L<sup>4</sup>, Kuys S<sup>4</sup>

<sup>1</sup>Physiotherapy, Adult Cystic Fibrosis Centre, The Prince Charles Hospital, MNHHS, Chermide, Australia,

<sup>2</sup>Physiotherapy Department, Prince Charles Hospital, MNHHS, Chermide, Australia, <sup>3</sup>Adult Cystic Fibrosis Centre, Prince Charles Hospital, MNHHS, Chermide, Australia, <sup>4</sup>School of Physiotherapy, Australian Catholic University, Banyo, Australia

CRP11B, Meeting Room C3.5, October 21, 2017, 1:45 PM - 2:30 PM

#### Aim:

To establish an allied health assistant (AHA) clinical role in an acute cardiorespiratory physiotherapy inpatient service for adult cystic fibrosis patients, and document safety of, and type interventions performed by an AHA.

#### Design:

Multiphase pragmatic study involving current service delivery [P1] and current service delivery plus AHA [P2]. Each phase was 3 months duration.

#### Method:

Prospective collection of safety outcomes and workload for physiotherapists and AHA: occasions of service (OoS) and types of clinical interventions. AHA clinical interventions included delegated roles in respiratory treatments, exercise treatments and exercise testing.

#### Results:

No adverse clinical events occurred during either phase. During P1 physiotherapists undertook 1072 respiratory and 338 exercise OoS. In P2 there were a total of 847 respiratory treatments, of which the AHA undertook 55 (7%). The AHA undertook 98 (28%) exercise treatment OoS, of a total of 357. Twenty-five exercise tests were completed in P1, increasing to 36 in P2. 58% (21) of these were completed by the AHA.

#### Conclusion/Key Practice Points:

- An AHA clinical role can be implemented safely in an acute cardiorespiratory service.
- An AHA can undertake delegated respiratory and exercise treatments.

- The AHA can also undertake delegated exercise testing. In this setting this resulted in an increase in the number of tests performed.
- Further objective data examining overall efficiencies for staff in terms of time outputs, scope of practice and cost analysis is required.

## INCREASING MOBILITY AND FUNCTIONING IN FRAIL OLDER PEOPLE

**Fairhall N<sup>1</sup>**

<sup>1</sup>*University of Sydney, Australia*

GPA11, Meeting Room C3.6, October 21, 2017, 1:45 PM - 2:30 PM

Frail older people have increased risk of poor mobility and functioning, hospitalisation and institutionalisation. There is a lack of consensus on the optimal intervention to maintain function in the frail population. This presentation will summarise the current best evidence for physiotherapy interventions to enhance functioning in frail older people. Evidence from systematic reviews and randomised trials will be presented, as well as the results of the author's Cochrane Review, currently underway, investigating the benefits and safety of mobility interventions on overall functioning and mobility in frail older people living in the community.

### Key Practice Points:

- Exercise interventions can improve mobility outcomes in frail older people.
- Multifactorial interventions may be more effective than single intervention in the frail population.
- The impact of interventions on frail people with cognitive impairment and residents of aged care facilities requires further investigation.

## PREVALENCE OF VESTIBULAR DYSFUNCTION IN 'FALLERS': A SYSTEMATIC REVIEW AND META-ANALYSIS

**Donovan J<sup>1</sup>**, Palmer G<sup>1</sup>, Cox H<sup>1</sup>, Semciw A<sup>1,2</sup>

<sup>1</sup>*Princess Alexandra Hospital, Woolloongabba, Australia*, <sup>2</sup>*University of Queensland, St Lucia, Australia*

GPA11, Meeting Room C3.6, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

To determine the proportion of fallers who have a diagnosed vestibular dysfunction.

### Design:

Systematic review and meta-analysis.

### Methods:

A systematic search of the literature was conducted using Medline, Embase, PsycINFO and CINAHL databases. Falls populations who had subsequent vestibular assessments were sought using terms related to 'accidental falls' and the 'vestibular system'. Studies were included if a fall had occurred in the last 12 months and at least one vestibular screening test was performed, in which nystagmus or corrective saccades were indicative of a dysfunction. The proportion of people with vestibular disorders were determined, and pooled in a proportion meta-analysis (with 95% confidence interval). Standardised mean differences were pooled using a random effects model.

### Results:

Eight studies were included with a total of 353 participants. Subjects were >50 years and predominantly women. Five studies recruited from hospital admission, the remaining studies recruited from clinics. The selected studies used a range of tests to determine the presence of a vestibular dysfunction. In this faller population, 57% [42% to 70%], I<sup>2</sup> = 82.5% p < 0.001).

### Conclusion:

- Over half of the population who have had a fall in the last 12 months may present with vestibular dysfunction.
- This information may provide impetus for increasing vestibular screening in falls prevention services across the continuum.

- It is thought that the prevalence listed here will encourage allied health teams not just to assess, but also to consider the provision, where applicable, of vestibular rehabilitation strategies in their falls prevention clinical practice.

## THE ROLE OF PRIMARY NOCICEPTION AND CENTRAL PROCESSES IN PERSISTENT PAIN

**Smith A<sup>1</sup>**

<sup>1</sup>*Recover Injury Research Centre, Griffith University, Gold Coast, Australia*

MPA11A, Meeting Room C4.8, October 21, 2017, 1:45 PM - 2:30 PM

**Aim:**

To review the role of nociception in persistent musculoskeletal pain

**Design:**

Experimental and systematic review

**Methods:**

This presentation draws on a) a series of studies investigating the role of facet joint nociception on the physical and psychological features in chronic whiplash-associated disorders ( $n = 53$ ) when compared to healthy controls ( $n = 32$ ), and b) a systematic review of the evidence relating to findings generated by multivariate pattern analysis following structural or functional magnetic resonance imaging to determine if this analysis is able to discriminate between individuals with musculoskeletal pain and healthy controls when evoked with noxious stimuli. This presentation review will also draw upon emerging data indicating that conservative therapy (behavioural and exercise therapy) may modulate non-nociceptive central processes.

**Results:**

a) Following medical interventions directed at ablating the source of nociception, individuals with whiplash symptoms demonstrated improvement in physical ( $p < .05$ ) and psychological ( $p < .01$ ) features, many commensurate to healthy controls; b) The systematic review demonstrated that there is preliminary and emerging evidence that multivariate pattern analyses of structural or functional MRI are able to discriminate between patients and healthy controls when evoked with noxious stimuli. Other data suggesting that brain changes can be normalised with peripherally targeted treatments—when those treatments successfully alleviated pain—will also be presented, whilst behavioural and exercise therapy modulation of non-nociceptive central processes will be highlighted.

**Conclusions:** Chronic pain is a complex phenomenon and clinicians should endeavour to identify central and peripheral processes and to direct management accordingly.

## CAN PAIN BE LEARNED? PAIN-ASSOCIATED CUES MODULATE PAIN SENSITIVITY

**Harvie D<sup>1</sup>**

<sup>1</sup>*Recover Injury Research Centre, Griffith University, Gold Coast, Australia, <sup>2</sup>University of Melbourne, Department of Surgery, Melbourne, Australia*

MPA11A, Meeting Room C4.8, October 21, 2017, 1:45 PM - 2:30 PM

**Aim:**

To determine if pain and pain sensitivity can be modulated by (associative) learning processes.

**Design:**

Experimental

**Methods:**

In three separate studies, the ability of threatening (pain-associated) cues to modulate pain and pain sensitivity was tested. In two laboratory classical conditioning studies, healthy subjects underwent a learning phase where specific tactile stimuli ( $n = 54$ ) or virtual reality scenes ( $n = 25$ ) were associated with painful stimulation. We then tested whether pain-associated stimuli/scenes modulate noxious-evoked pain and mechanical pain sensitivity. In a third study, we tested whether pain-associated kinesthetic cues could

modulate pain with movement independent of actual movement, in people with persistent neck pain (n = 24). This was tested by asking participants to rotate their neck to their first onset of pain, in conditions where a virtual reality displayed over- or under-stated movement—creating the perception of more or less movement than was actually occurring.

#### Results:

In the laboratory studies, pain-associated tactile and environmental cues mediated an increased in perceived intensity of concurrently presented nociceptive stimuli ( $p < 0.05$ ), and resulted in a reduction in mechanical pain thresholds ( $p < 0.05$ ). In the clinical study, neck pain with movement depended on the perceived, not only actual movement ( $p < 0.05$ ). Secondary outcomes suggest the ability of pain-associated cues to modulate pain is independent of explicit expectation.

#### Conclusion:

Pain-associated cues enhance pain, suggesting that associative learning contributes to a unique form of central sensitivity that may have clinical relevance.

### THE RELATIONSHIPS BETWEEN PSYCHOLOGICAL AND CLINICAL VARIABLES DURING BOTH TISSUE-FOCUSED AND PSYCHOLOGICALLY INFORMED PHYSIOTHERAPY

**Bunzli S<sup>1,2,3</sup>**, Rabey M<sup>3</sup>, Smith A<sup>3</sup>, Beales D<sup>3</sup>, O'Sullivan P<sup>3</sup>

<sup>1</sup>Recover Injury Research Centre, Griffith University, Gold Coast, Australia, <sup>2</sup>University of Melbourne, Department of Surgery, Melbourne, Australia, <sup>3</sup>Curtin University, School of Physiotherapy and Sports Sciences, Perth, Australia

MPA11A, Meeting Room C4.8, October 21, 2017, 1:45 PM - 2:30 PM

#### Aim:

To examine the temporal evolution of an individuals' psychological and somatosensory profile at repeated time points while seeking Physiotherapy care for chronic low back pain (CLBP).

#### Design:

Single-case study

#### Method:

We tracked a single subjects' clinical journey across two different Physiotherapy interventions: a Physiotherapy-led exercise intervention targeting core strength, and Cognitive Functional Therapy targeting illness perceptions, fear and behaviour. At 6, 10 and 18-months post-injury, qualitative interviews explored social context and illness perceptions; and questionnaires measured disability and psychological constructs. At 6 and 18-months post-injury, Quantitative Sensory Testing (QST) assessed pain sensitivity.

#### Results:

At 6-months post-injury, the subject attributed CLBP to spinal damage from work activity. She had high fear; low activity levels; localised and remote hypersensitivity. At 10-months post-injury the subject had completed an exercise intervention. She perceived her spine was weak, employed avoidance strategies to control her pain and had stopped working. She reported improved pain and self-efficacy, but higher fear. At 18-months post-injury, the subject had completed a Cognitive Functional Therapy intervention. She attributed CLBP to 'a wound-up nervous system', and believed relaxing and moving without protecting her spine had resolved her pain. Pain, disability and fear had resolved. Local and remote pain thresholds resembled healthy controls, reflecting reduced pressure and thermal hypersensitivity.

#### Conclusions:

Changed illness perceptions and reduced fear were observed in association with reductions in CLBP disability and pain sensitivity. Intervention studies with repeated measures are needed to explore the relationships between modifiable psychological constructs i.e. fear, illness perceptions and pain sensitivity.

## THE MULTISENSORY PATIENT: NOVEL FINDINGS FROM NEUROSCIENCE AND THEIR CLINICAL IMPLICATIONS

**Stanton T**

MPA11A, Meeting Room C4.8, October 21, 2017, 1:45 PM - 2:30 PM

### Outline of presentation:

Our perception of the world and of our own body is inherently multisensory. Incoming sensory information is constantly being filtered, prioritised and combined to create a unified perception of reality. Much of this modulation and integration occurs outside of our awareness; this gives us the sense that what we experience is, indeed, reality. Through extensive communication and integration with our motor system, these perceptions can have clear links to motor behaviour and potentially, our chosen actions. Given this, changes to perception of the body and to the environment are critical to consider in clinical populations.

This talk will first explore the role of implicit (unconscious) bias in shaping our perceptual experiences.

Second, it will briefly discuss the evidence for altered bodily perception and environmental perception in pain.

Last, it will explore research showing that manipulation of multisensory information can impact sensations such as pain and stiffness.

### Key Practice Points:

- Considering the multisensory environment of treatment spaces is relevant.
- The use of multisensory input (e.g., vision, sound) in treatment is promising.
- Use of known optical/perceptual illusions may assist in educating patients about the role that multisensory information plays in pain and other clinical symptoms.

## FACTORS INFLUENCING RESTING POSTURE OF THE SHOULDER GIRDLE IN ASYMPTOMATIC INDIVIDUALS

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MPA11B, Meeting Room C4.10, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

To describe shoulder girdle resting posture in asymptomatic individuals, and identify whether age, body mass index, sex, hand dominance, physical activity, and thoracic posture factors influence resting posture.

### Design:

Cross-sectional study

### Methods:

3D orientation of thoracic spine, scapula and clavicle was recorded from 100 asymptomatic individuals while standing relaxed. 3D Orientation was expressed in the external reference frame. Mean and variability between individuals were calculated and relationships between scapula, and clavicle orientation and individual characteristics, and thoracic posture were evaluated using multiple regression analysis.

### Results:

Mean (standard deviation, right and left) scapula resting posture; internal/external rotation 30.7° (5.9°), upward/downward rotation 0.5° (5.7°), and anterior/posterior tilt -10.3° (5.1°). Mean (SD) clavicle resting posture; protraction/retraction -22.5° (5.3°), and elevation/depression -7.7° (4.4°). Scapula anterior tilt was strongly influenced by thoracic inclination ( $R^2=0.66$ ,  $p<0.001$ ) and scapula internal rotation mostly by clavicle protraction ( $R^2=0.56$ ,  $p<0.001$ ). Scapula upward rotation was influenced mainly by thoracic inclination and clavicle elevation but also by clavicle protraction ( $R^2=0.5$ ,  $p<0.001$ ). Body mass index and age had a significant albeit weak influence on resting scapula posture. Physical activity, sex, and hand dominance did not show any significant influence on scapula resting posture. Clavicle resting posture did not show a strong association ( $R^2<0.141$ ) with any of the independent factors.

#### Key Practice Points:

- There is substantial variability of shoulder girdle resting posture between asymptomatic individuals.
- Thoracic inclination and clavicle posture have a strong influence on scapula posture at rest.
- Physical activity, sex, and hand dominance do not influence resting posture of the scapula.

#### HEAD TILT RESPONSE: A NOVEL METHOD TO TEST SPATIAL ORIENTATION IN INDIVIDUALS WITH IDIOPATHIC NECK PAIN

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<sup>1</sup>*The University of Newcastle, Callaghan, Australia*

MPA11B, Meeting Room C4.10, October 21, 2017, 1:45 PM - 2:30 PM

#### Aim:

To investigate whether differences in head tilt response (HTR) can be identified between individuals with idiopathic neck pain and healthy individuals and whether HTR correlates with the commonly used subjective visual vertical (SVV).

#### Design:

A cross-sectional analysis of individuals with idiopathic neck pain and healthy controls matched by gender, age, and physical activity level as measured by the Godin-Shephard questionnaire.

#### Method:

HTR and SVV were measured in 34 individuals with neck pain (mean pain on 4-week VAS: 49.2/100, 95% CI 41.9 to 56.5) and 34 healthy controls. Both tests were administered using a virtual reality (VR) device in which custom software was presented. Either two dots, or a line, had to be positioned vertically in space by using a computer mouse (SVV) or by laterally flexing the neck (HTR). The VR device eliminated all visual references of verticality. Differences between groups were determined with independent t-tests.

#### Results:

A significant difference in HTR was found between individuals with neck pain and healthy individuals (mean difference .089, 95% CI .082 to .097,  $p=.001$ ). For the SVV test, no significant difference was found between group means. A weak correlation (Spearman's  $\rho=.105$ ) was found between HTR and SVV outcomes.

#### Conclusion/Key Practice Points:

- HTR, a novel method suggested to be supplementary to the SVV, was able to differentiate between individuals with idiopathic neck pain and healthy individuals.
- Based on the discriminating ability of HTR, it may be a better method than SVV in assessing visuomotor control in individuals with idiopathic neck pain.

#### ASSOCIATION BETWEEN IMPAIRMENTS OF CERVICAL SPINE DYSFUNCTION AND POSTURAL CONTROL IN OLDER ADULTS WITH NECK PAIN

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MPA11B, Meeting Room C4.10, October 21, 2017, 1:45 PM - 2:30 PM

#### Aim:

The purpose of this study is to further understand the mechanisms underpinning neck-pain related postural control impairments in older adults. In this study, we sought to determine which neck-pain related factors are associated with static and dynamic postural control.

#### Design:

This is an exploratory cross-sectional study.

#### Method:

Thirty older adults with neck pain were recruited using convenience sampling. Static postural control in standing was evaluated using the Wii Balance Board and dynamic postural control was assessed using the

dynamic gait index. Neck pain impairments included forward head posture using the craniovertebral angle, thoracic kyphosis and lordosis assessed by the flexicurve, joint position error using the modified joint position error test, neck flexor and extensor endurance assessed in supine and prone respectively, cervical rotation range-of-motion measured by the cervical range-of-motion device and self-perceived dizziness disability measured by the dizziness handicap inventory.

**Results:**

In multiple regression analyses, only forward head posture contributed significantly to the model with centre-of-pressure sway (amplitude or sd) as the dependent parameter and dizziness handicap was negatively associated with dynamic gait index ( $p < 0.05$ ).

**Conclusion/Key Practice Points:**

- In older adults with neck pain, forward head posture is positively associated with centre-of-pressure sway in standing and the level of dizziness handicap is negatively associated with dynamic balance.
- The results of this study are of importance in developing intervention strategies, but they call for further study.

**EVIDENCE-BASED MANAGEMENT OF PEOPLE WITH SYMPTOMATIC HYPERMOBILITY: A REVIEW**

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MPA11C, Meeting Room C4.3, October 21, 2017, 1:45 PM - 2:30 PM

**Aim:**

To provide an evidenced-based framework for the physiotherapy management of individuals with symptomatic hypermobility.

**Design:**

International consensus opinion and evidence review.

**Method:**

Clinical and research physiotherapy research experts from Europe, North America and Australia collaborated with patient representatives to provide recommendations for physiotherapy assessment and management of individuals with symptomatic hypermobility based on the current available evidence.

**Results:**

Current published evidence on the efficacy of physiotherapy management for individuals with symptomatic hypermobility is limited, with only three randomised controlled trials published to date, all of which have assessed the efficacy of exercise therapy on musculoskeletal impairments in this patient population, all with promising results. Education, manual therapy, taping and aquatic physiotherapy are all recommended treatment options, however evidence for these only exists from case reports and clinical opinions. The multisystemic nature of symptomatic hypermobility suggests physiotherapists may also play an integral role in the management of these symptoms including dysautonomia, urinary incontinence, gastrointestinal complaints and gross motor function, although the efficacy of management in this population has not been assessed. Clinical assessment should consider all systems and follow an individualised approach.

**Conclusion/Key Practice Points:**

- Thorough clinical assessment should be undertaken to determine the multisystemic symptoms experienced by each patient.
- Treatment should be individualised and evidence-based where able. Significant research opportunities exist to fill the current gaps in evidence.

## FEATURES THAT AFFECTED FATIGUE SEVERITY AND QUALITY OF LIFE IN JOINT HYPERMOBILITY SYNDROME / EHLERS-DANLOS SYNDROME – HYPERMOBILITY TYPE

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<sup>1</sup>The University of Sydney, Camperdown, Australia

MPA11C, Meeting Room C4.3, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

To assess the prevalence, severity and impact of fatigue on individuals with Joint Hypermobility Syndrome / Ehlers-Danlos Syndrome – Hypermobility type and establish possible determinants of fatigue severity and health-related quality of life in this population.

### Design:

Cross-sectional study using reliable and valid measures of self-reported fatigue, hypermobility, quality of life, mental health, pain and joint instability.

### Method:

117 diagnosed participants were recruited through social media and word of mouth. All completed questionnaires to quantify fatigue, mental health, quality of life and physical activity. Body-charts and visual analogue scales were used to report on severity of pain and joint instability, satisfaction with healthcare, and multi-system manifestations of the disease. Multiple regression analysis was performed to identify predictors of fatigue and quality of life.

### Results:

Severe fatigue was reported by 80% of participants. Five determinants of fatigue severity were found to explain 52% of variability in fatigue level; relationship score, self-perceived hypermobility, orthostatic dizziness, level of physical activity and satisfaction with healthcare. Physical activity level, the number of painful joints and the extent of depression predicted 55% of the variability in participants' quality of life.

### Conclusion/Key Practice Points:

- Four of the five determinants of fatigue and all the determinants of quality of life are modifiable with appropriate medical, physiotherapeutic, pharmaceutical and psychological management.
- Fatigue is indeed a significant and debilitating characteristic of this disease which does not appear on any of the diagnostic criteria.

## ARE NEW GRADUATE PHYSIOTHERAPISTS READY FOR PRIVATE PRACTICE?

**Wells C<sup>1</sup>**, Bialocerkowski A<sup>1</sup>, Carroll S<sup>2</sup>, Chipchase L<sup>3</sup>, Kent F<sup>4</sup>, Olson R<sup>5</sup>, Reubenson A<sup>2</sup>, Scarvell J<sup>6</sup>

<sup>1</sup>Griffith University, Southport, Australia, <sup>2</sup>Curtin University, Bentley, Australia, <sup>3</sup>Western Sydney University, Campbelltown, Australia, <sup>4</sup>Monash University, Frankston, Australia, <sup>5</sup>University of Queensland, St Lucia, Australia, <sup>6</sup>University of Canberra, Bruce, Australia

MPA11C, Meeting Room C4.3, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

What are the perspectives of physiotherapy academics, employers, and recent graduates regarding the readiness of new graduate physiotherapists for private practice employment?

### Design:

A mixed methods study was conducted between April and November 2016.

### Method:

Academics, employers, and recent graduates from around Australia participated in 3 electronic surveys and twelve focus groups. Participants ranked perceived readiness of new graduates on a 5 point Likert scale (0 = not at all ready, 1 = not ready, 2 = somewhat ready, 3 = ready, 4 = very ready). Thematic analysis and coding of qualitative data was undertaken by two researchers using Nvivo.

#### Results:

112 participants completed the survey, and 52 participated in focus groups. Participants agreed that first and second year graduates were “somewhat ready” for private practice (Median = 2.5-3.0, IQR = 2.0, 4.0) and third year graduates were “ready” (Median = 4.0, IQR = 3.0, 5.0). The perceived benefits of new graduates include their enthusiasm, readiness to learn, and contemporary and research-informed knowledge. New graduates do, however, have limitations in clinical, business, and transferable knowledge and skills. These include difficulties with clinical reasoning and case management without senior support and under time pressure; understanding business finances, administration and marketing; and demonstrating effective communication skills and confidence.

#### Conclusion/Key Practice Points:

- New graduate physiotherapists are “somewhat ready” for private practice, but require improvement in clinical, business and transferable knowledge and skills.
- Future research should examine strategies to improve new graduate knowledge and skills to enhance readiness for private practice.

### CENTRAL SENSITISATION AND STRESS AFTER WHIPLASH INJURY: IMPLICATIONS FOR PHYSIOTHERAPY PRACTICE

**Sterling M<sup>1</sup>**

<sup>1</sup>The University of Queensland, Herston, Australia

MPA11D, Darling Harbour Theatre, October 21, 2017, 1:45 PM - 2:30 PM

#### Background:

Up to 50% of patients with acute whiplash associated disorders (WAD) do not fully recover and continue experiencing multiple symptoms such as chronic neck pain, fatigue, dizziness, concentration difficulties and headaches. Radiological findings or cervical dysfunctions do not account for the development of chronic WAD. On the other hand, there is increasing evidence that WAD are characterized by dysfunctional stress response systems and hyperexcitability of the central nervous system. The former include a dysfunctional hypothalamus-pituitary-adrenal axis and altered autonomic reactivity, and the latter imply dysfunctional endogenous analgesia (in response to nociceptive stimuli and exercise), decreased spinal reflex thresholds, increased temporal summation of pain, and widespread hyperalgesia. The stress response system can influence pain through several neurophysiologic mechanisms. This is supported by the findings that stress related symptoms and physiological stress processes have predictive value in the transition from acute to chronic WAD. Severe stress also leads to diminished availability of several key central nervous system neurotransmitters (e.g. GABA and serotonin), possibly explaining the inability of patients with WAD to activate top-down endogenous analgesia (in response to exercise).

#### Results:

Physiotherapy treatments such as some forms of exercise can modulate these processes and evidence will be presented outlining these effects. In addition preliminary RCT evidence of treatments not usually associated with physiotherapy but delivered by physiotherapists such as stress modulation techniques show promising effects of preventing chronic pain and disability.

#### Key Practice Points:

- Central hyperexcitability and stress play a role in the presentation and outcomes after whiplash injury
- Exercise may exert either hypo or hyper algesic effects and may depend on the type, duration and intensity of exercise
- Stress modulation techniques integrated with usual physiotherapy show promise in preventing chronic pain.
- Physiotherapists can effectively deliver these techniques and find them a useful addition.

## PREVENTION OF SPINAL PAIN

**Hancock M<sup>1</sup>**

<sup>1</sup>*Macquarie University, North Ryde, Australia*

MPA11D, Darling Harbour Theatre, October 21, 2017, 1:45 PM - 2:30 PM

Prevention is a fundamental tenant of most areas of health care, but has been largely ignored in spinal pain. While thousands of clinical trials have investigated treatments for spinal pain, few trials have investigated prevention. Arguably the balance is wrong. Prevention of spinal pain can involve either primary prevention or secondary prevention. Growing epidemiological evidence suggests that while many people with acute spine pain recover well over a relatively short period of time, a large proportion will have recurrences. If recurrences of spinal pain can be effectively prevented this has the potential to massively reduce the personal and societal burden of the condition. This presentation will cover epidemiological evidence including trajectories of back pain that strongly suggest the need for effective prevention. The latest evidence for prevention of spinal pain will be presented.

### Key Practice Points:

- The natural course of most episodes of spinal pain is good; however, recurrence rates are very high
- Preliminary evidence suggests exercise and education approaches are effective in substantially reducing recurrence rates
- Physiotherapists should consider placing more focus on prevention of future episodes.

## NO LONGER ALONE AND INACTIVE: AN OBSERVATIONAL STUDY OF ACTIVITY LEVELS IN REHABILITATION

**Scrivener K<sup>1</sup>**, Dean B<sup>1</sup>, Gallagher S<sup>1</sup>, Henrisson W<sup>1</sup>, Thorburn M<sup>1</sup>, Jones T<sup>1</sup>, Dean C<sup>1</sup>

<sup>1</sup>*Department of Health Professions, Macquarie University, Macquarie Park, Australia*

NNG11A, Meeting Room C4.7, October 21, 2017, 1:45 PM - 2:30 PM

### Question:

To investigate activity levels of inpatients undergoing rehabilitation in a new rehabilitation facility with innovative design and multidisciplinary care. To determine whether activity levels are different on weekdays compared to the weekend. To determine if activity levels differ over a 12-month period.

### Design:

An observational study conducted in a mixed inpatient rehabilitation unit.

### Method:

Behaviour mapping recorded participants' location, people present, body position and activity type, every 10-minutes for 13-hours, on two weekdays and one weekend day. Results were calculated as the proportion of observations participants spent in each location, body position and performing activities (physical, cognitive, social), and time spent alone and inactive.

### Results:

15 individuals participating in rehabilitation were recruited for this study. Participants had neurological, orthopaedic and other health conditions. On average participants were engaged in activity for 86% (Standard Deviation [SD] 9) of the day, with physical activity accounting for 51% (SD 11), cognitive activity 28% (SD 10) and social activity 42% (SD 16). There was more physical activity (Mean difference [MD] 8%, 95% CI 4 to 12) and less social activity (MD -6%, 95% CI -11 to -1) on weekdays compared to weekends. Overall participants were alone and inactive for 12% (SD 9) of the day. Participants observed in 2016 displayed similar results to those observed in 2015.

### Key Practice Points:

- It is possible to achieve and maintain high levels of activity in rehabilitation.
- The environmental design of facilities and organisation of therapy may be modified to encourage activity.

## CAN WE IMPROVE FREE-LIVING PHYSICAL ACTIVITY WITH CLINICAL INTERVENTIONS AFTER STROKE? A SYSTEMATIC REVIEW

**Temby R<sup>1</sup>**, Mahendran N<sup>1</sup>, Preston E<sup>1</sup>, Salmon R<sup>1</sup>

<sup>1</sup>*Discipline of Physiotherapy, Faculty of Health, University of Canberra, Canberra, Australia*

NNG11A, Meeting Room C4.7, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

To determine if clinical interventions are effective at increasing device-based measures of volume and intensity of free-living physical activity after stroke.

### Design:

Systematic review with meta-analysis of randomised controlled trials.

### Method:

Stroke survivors were categorised as subacute or chronic. Clinical interventions were classified as a) self-management, b) free-living activity behaviour change or c) clinic-based therapeutic interventions. Measures of free-living physical activity were collected via accelerometers, and included daily step count, time spent walking and time spent in moderate intensity physical activity per day.

### Results:

Twelve trials were identified and seven had data that could be included in the meta-analysis. There was insufficient data on measures of moderate intensity physical activity to be included in the meta-analysis. Effect size was calculated as standardised mean differences, as various measures of volume of free-living physical activity were used. Clinic-based therapeutic interventions were successful at increasing free-living physical activity volume compared to usual therapy (SMD 1.51, 95% CI 0.13 to 2.89), with the most significant effect found in participants with chronic stroke (SMD 1.42, 95% CI 0.01 to 2.84). There was no effect for free-living activity behaviour change interventions (SMD 0.14, 95% CI -0.13 to 0.41), and insufficient data on self-management interventions for a sub-group analysis. No significant pooled effect was observed for any intervention type in people with subacute stroke (SMD 0.18, 95% CI -0.7 to 0.43).

### Conclusion/ Key Practice Points:

- Free-living physical activity can be increased through clinic-based therapeutic interventions in stroke survivors, in particular, people with chronic stroke.

## WHAT ARE WE DOING NOW? CURRENT AUSTRALIAN WEEKEND ALLIED HEALTH SERVICE PROVISION IN REHABILITATION UNITS

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<sup>1</sup>*UnitingCare Health, Windsor, Australia*, <sup>2</sup>*University of Queensland, Brisbane, Australia*, <sup>3</sup>*Australian Catholic University, Brisbane, Australia*

NNG11A, Meeting Room C4.7, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

To determine current rehabilitation allied health weekend service provision in Australia, and identify staff perceptions of barriers and facilitators to providing this service.

### Design:

Cross-sectional electronic survey of Australian rehabilitation facilities

### Method:

A senior rehabilitation physiotherapist from each facility completed an electronic survey. The survey contained open and closed-ended questions exploring current weekday and weekend service provision, staffing and perceived outcomes, and barriers and facilitators to providing a weekend service in rehabilitation.

### Results:

Surveys were completed by 179 facilities (83% response rate). Weekend therapy was provided by 94 facilities (53%), with 60% located in metropolitan areas, and 68% privately funded. Of those providing weekend rehabilitation, the majority (97%) of respondents provided a Saturday service, most commonly as a

half-day service (66%). Forty percent provided a Sunday service. The most common weekend services provided were physiotherapists (90%), allied health assistants (22%), occupational therapists (19%) and speech pathologists (17%). The majority of facilities reported increased patient/family satisfaction (66%) and faster goal attainment (55%) with weekend rehabilitation provision. Common barriers included budgetary restraints (66%) and staffing availability (54%), with facilitators including organisational (76%) and staff support (61%), and staffing availability (62%). Clinicians generally felt that weekend service provision in rehabilitation was positive for patients.

**Conclusion/ Key Practice Points:**

- Over half of Australian rehabilitation facilities provide a weekend service; most commonly being a half-day physiotherapy Saturday service, in private metropolitan facilities.

## **CAREGIVER-MEDIATED EXERCISES SUPPORTED BY TELEHEALTH TO INCREASE EXERCISE INTENSITY AFTER STROKE: RESULTS AND PATIENTS' EXPERIENCES**

**van den Berg M<sup>1</sup>**

<sup>1</sup>*Rehabilitation, Aged and Extended Care, School of Health Sciences, Flinders University, Adelaide, Australia*

NNG11B, Meeting Room C4.9, October 21, 2017, 1:45 PM - 2:30 PM

**Aim:**

To 1) Investigate the effects of intervention combining caregiver-mediated exercises (CME) with telerehabilitation on patient self-reported mobility and caregiver burden, and 2) Comprehensively explore experiences of participants.

**Design:**

Randomised controlled trial with a qualitative sub-study.

**Method:**

Sixty-three stroke patients (mean age 68.7 years, 64% female) and their caregivers were randomized to usual care or 8-week CME program with telehealth support (30min/5 times/week). Functional mobility and self-reported outcome measures (patient and caregiver) were assessed at baseline, 8 and 12 weeks, plus length of stay (LOS) and number of readmissions (NOR). Participants' experiences were examined in semi-structured interviews upon intervention completion.

**Results:**

Intention-to-treat analysis showed no between-group difference in Stroke Impact Scale (SIS)-mobility ( $p=0.6$ ), however caregivers reported less fatigue (4.6, CI95% 0.3-8.8,  $p=0.04$ ), and higher self-efficacy (-3.3, CI95% -5.7--0.9,  $p=0.01$ ) at week 12. Per protocol analysis demonstrated a trend towards improved SIS mobility ( $p=0.06$ ), significantly improved extended ADL scores at week 8 ( $p=0.01$ ) and 12 ( $p=0.03$ ), 9-day shorter LOS ( $p=0.046$ ), and fewer readmissions over 12 months ( $p=0.0464$ ). Thematic analysis of interview data revealed three overarching themes: 1) Carer role bearable or burdensome: depends who you ask; 2) iPad technology provides opportunities for ongoing mentoring and coaching; and 3) "You need the mental (support) as well as the physical".

**Conclusion/Key Practice Points:**

- CME supported by telerehabilitation appears feasible to augment exercise intensity post-stroke, resulting in improved patient and caregiver outcomes.
- Program implementation should consider perceived time constraints, the importance of an individualized program, and the potential of expanding this rehabilitation model to a holistic program.

## CLINICAL GUIDELINES FOR STROKE MANAGEMENT 2017 – KEY CHANGES TO RECOMMENDATIONS FOR PHYSIOTHERAPISTS

**English C<sup>1</sup>**, Wright L<sup>2</sup>, Peng C<sup>2</sup>, Hill K<sup>2</sup>, Aslett T<sup>2</sup>, Watkins J<sup>2</sup>

<sup>1</sup>*School of Health Sciences and Priority Research Centre for Stroke and Brain Injury University Of Newcastle, Newcastle, Australia*, <sup>2</sup>*Stroke Foundation, Melbourne, Australia*

NNG11B, Meeting Room C4.9, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

The Clinical Guidelines for Stroke Management have recently been updated. We aim to highlight changes in the key recommendations in the Clinical Guidelines relevant to physiotherapists.

### Design:

Guideline development utilising Grading of Recommendations, Assessment, Development and Evaluation (GRADE) methodology.

### Method:

We conducted systematic searches of all relevant literature from February 2010 to July 2016. Interdisciplinary working parties of over 90 healthcare professionals (17 physiotherapists) contributed to literature reviews, data extraction and formulation of recommendations. The Guidelines underwent public consultation, methodological and independent content reviews.

### Results:

Eight hundred studies informed 250 recommendations. Key changes to recommendations include: assessment for rehabilitation needs should occur within 24-48 hours of admission to hospital, mobilisation should commence between 24 and 48 hours after stroke (but not before), patients should receive a minimum of 3 hours/day scheduled therapy with at least 2 hours of active task practice and incorporating cardiorespiratory fitness training, circuit class therapy, virtual reality and treadmill training can be used as modalities to increase practice time. Brain stimulation should not be used in routine practice, and only in a research framework.

### Conclusion/ Key Practice Points:

- Physiotherapists involved in stroke care should ensure they are aware of key changes in recommendations in the updated Guidelines.
- It is expected the Guidelines will be endorsed by the National Health and Medical Research Council and released in July 2017.
- Given the rapidly growing evidence base to stroke care, an innovative approach to dynamically updating the Guidelines is required and is under development.

## INTERVENTIONS TO IMPROVE GROSS MOTOR PERFORMANCE IN CHILDREN WITH NEURODEVELOPMENTAL DISORDERS: A META-ANALYSIS

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NPG11A, Meeting Room C4.11, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

To systematically review the literature to investigate the effectiveness of conservative interventions to improve gross motor performance in children with a range of neurodevelopmental disorders.

### Design:

Systematic review with meta-analysis of papers published between January 1980 to June 8, 2015.

Method: MEDLINE, EMBASE, AMED, CINAHL, PsycINFO, PEDro, Cochrane Collaboration, Google Scholar databases and clinical trial registries were searched. Published randomised controlled trials of children aged 3 to ≤18 years with mild to moderate gross motor impairment receiving (i) non-pharmacological or non-surgical interventions from a health professional and had (ii) gross motor outcomes obtained using a standardised assessment tool were included. Methodological quality and strength of meta-analysis recommendations were evaluated using Pedro and the GRADE approach respectively.

### Results:

Of 2513 papers, 9 met inclusion criteria including children with Cerebral Palsy (n = 2) or Developmental Coordination Disorder (n = 7) receiving 11 different interventions. Only two of 9 trials showed an effect for treatment. Using the least conservative trial outcomes a large beneficial effect of intervention was shown (SMD:-0.8; 95% CI:-1.1 to -0.5) with “very low quality” GRADE ratings. Using the most conservative trial outcomes there is no treatment effect (SMD:-0.1; 95% CI:-0.3 to 0.2) with “low quality” GRADE ratings.

### Conclusion/Key Practice Points:

- Although we found that some interventions with a task-orientated framework can improve gross motor outcomes in children with Developmental Coordination Disorder or Cerebral Palsy, these findings are limited by the very low quality of the available evidence.
- High quality intervention trials are urgently needed.

## PHYSICAL ACTIVITY LEVELS AND THE PERCEIVED BARRIERS TO PHYSICAL ACTIVITY PARTICIPATION IN CHILDREN WITH OSTEOGENESIS IMPERFECTA

Jones T<sup>1</sup>, **Theophile I<sup>1</sup>**, Price A<sup>1</sup>, Munns C<sup>2</sup>, Pacey V<sup>1,2</sup>

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NPG11A, Meeting Room C4.11, October 21, 2017, 1:45 PM - 2:30 PM

### Aims:

To quantify the level of physical activity performed by children with Osteogenesis Imperfecta and identify barriers to physical activity as perceived by children and their parents.

### Design:

Observational Study

#### Method:

Fifty-four children aged 7-17 years, with a confirmed diagnosis of mild, moderate or severe Osteogenesis Imperfecta were recruited for this study. The Actigraph GT3XE was used to record average daily moderate-vigorous physical activity, and the ActivPAL3 was used to record average daily time spent sitting, standing, stepping and average daily step count. Child and parent specific questionnaires examined barriers to physical activity.

#### Results:

Wear time eligibility for the Actigraph GT3XE and ActivPAL3 was achieved in 28 and 32 children respectively. Only 46% of participants met the current guidelines of 60 minutes/day of moderate-vigorous physical activity, and 25% of participants achieved the recommended average for children of a minimum of 12,000 steps/day. Health professional recommendations to restrict physical activity was the most frequently child-reported barrier (73%), and the second most frequently parent-reported barrier (70%). The most frequently parent-reported barrier was that physical activity will cause their child pain (76%). There was no association between overall frequency of barriers reported and physical activity.

#### Conclusions/Key Practice Points:

- This is the largest study examining physical activity in children with Osteogenesis Imperfecta, with most children not reaching national guidelines.
- Health professional recommendation to restrict physical activity is perceived as a significant barrier to physical activity participation.
- Facilitation of safe physical activity for children with Osteogenesis Imperfecta, while continuing to minimise fracture risk, warrants further consideration.

#### EAT, SLEEP, PLAY, CONNECT - PARTICIPATION OUTCOME MEASURES FOR INFANTS 0-2 YEARS: A SYSTEMATIC REVIEW

**Mobbs C<sup>1,2</sup>**, Spittle A<sup>3,4</sup>, Johnston L<sup>1</sup>

<sup>1</sup>The School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, Australia,

<sup>2</sup>Toowoomba Hospital, Darling Downs Hospital and Health Service, Queensland Health, Toowoomba, Australia, <sup>3</sup>The University of Melbourne, School of Physiotherapy, Melbourne, Australia, <sup>4</sup>Murdoch Children's Research Institute, Melbourne, Australia

NPG11A, Meeting Room C4.11, October 21, 2017, 1:45 PM - 2:30 PM

#### Aim:

To identify and examine the psychometric properties of participation outcome measures for infants aged birth to two years eleven months.

#### Design:

Systematic review according to PRISMA Guidelines

#### Methods:

Four electronic databases were searched from 2001 to August 2016 to identify assessments that (i) measured at least one participation concept of 'attendance' and/or 'involvement' according to the Imms et al 'Family of Participation Related Constructs', (ii) with psychometric data for infants or children aged birth to two years eleven months (iii) were published in English in full text in a peer reviewed journal. The COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) Checklist was used to evaluate each measure according to the quality of evidence for psychometric data.

#### Results and conclusion:

Searches identified 1249 articles, of which seven outcome measures (14 studies) met the inclusion criteria, including: the Assessment of Preschool Children's Participation, Canadian Occupational Performance Measure, Child Engagement in Daily Life Measure, Children's Assessment of Participation with Hands, Daily Activities of Infants Scale, Test of Playfulness and Young Children's Participation and Environment Measure. All seven measures measured 'attendance' through diversity and/or frequency. Three also measured 'involvement'. There was a paucity of psychometric data for all tests in the target age range. Four measures

were available for children aged older than six months; therefore unable to measure participation of younger infants.

**Key Practice Points:**

- Urgent research is needed to develop new participation measures that are valid, reliable and responsive when evaluating 'attendance' and 'involvement' constructs for young infants.

**KIDS-BESTEST: A COMPREHENSIVE ASSESSMENT OF POSTURAL CONTROL IN CHILDREN**

**Dewar R<sup>1</sup>**, Johnston L<sup>1</sup>

<sup>1</sup>*The University Of Queensland, St Lucia, Australia*

NPG11B, Meeting Room C4.6, October 21, 2017, 1:45 PM - 2:30 PM

**Background:**

Disordered postural control contributes to significant activity and participation limitations in children with various neurological disorders. No comprehensive assessment of postural control currently exists for children. The BESTest is an assessment used in adults and based on the systems approach to postural control. The reproducibility of the BESTest has been established in children and a modified version, Kids-BESTest, has been recommended.

**Aims/objectives:**

To improve participant's knowledge on postural control and the systems approach framework. To familiarise participants with a comprehensive assessment of postural control, the Kids-BESTest,

**Approach:**

Presenters will provide background information in a lecture style format which will include information on postural control definitions, frameworks for clinical application and the development of the Kids-BESTest (10 mins). Participants will be shown video of the Kids-BESTest being performed with a child with a physical disability (10 mins). Participants will then be given the chance to practice items from the Kids-BESTest (20mins). Kids-BESTest score sheets and instruction sheets will be provided to participants. As well as information for access to a free website and further online training.

**Key Practice Points:**

- Participants will have an improved understanding of postural control in the paediatric context
- Participants will have a framework for understanding postural control in children with neurological disorders
- Participants will have a clinical assessment that will comprehensively profile postural control disorders in children, which will direct intervention.

**REDUCING PROLONGED SITTING IN THE WORKPLACE**

**Healy G**

OHP11, Meeting Room C3.3, October 21, 2017, 1:45 PM - 2:30 PM

The last decade has seen substantial scientific, industry and community interest in the impact of too much sitting, and workplaces are now clamoring for (cost)-effective tools to address this emergent work health and safety issue. In 2018, the BeUpstanding Champion Toolkit will be launched as a free online resource. This Toolkit is designed to support workplaces to stand up, sit less and move more for a happier, healthier workforce. This presentation will discuss the evidence and industry/government partnerships that informed the development of the Toolkit, as well as showcase the Toolkit itself.

**Key Practice Points:**

- Identification of sedentary work as an emergent work health and safety issue
- Solutions to help your clients stand up, sit less and move more in the workplace.

## WEIGHT-BEARING ASYMMETRY AFTER STROKE: USING ACCESSIBLE TECHNOLOGIES TO EXAMINE RELATIONSHIPS WITH PHYSICAL FUNCTION

**Bower K<sup>1</sup>**, Thilarajah S<sup>2</sup>, Williams G<sup>3,4</sup>, Tan D<sup>2</sup>, Pua Y<sup>2</sup>, Clark R<sup>1</sup>

<sup>1</sup>University Of The Sunshine Coast, Sippy Downs, Australia, <sup>2</sup>Singapore General Hospital, , Singapore,

<sup>3</sup>Epworth HealthCare, Melbourne, Australia, <sup>4</sup>University of Melbourne, Melbourne, Australia

R5-11, Meeting Room C4.2, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

To examine the relationship between weight-bearing asymmetry and physical function following stroke.

### Design:

Multi-centre cross-sectional study.

### Method:

Eighty-three post-stroke individuals from four inpatient rehabilitation facilities within Australia (n = 20) and Singapore (n = 63) and were assessed within one week prior to discharge. Wii Balance Boards were used to obtain weight-bearing asymmetry during static standing and sit-to-stand. A Microsoft Kinect camera was used to collect gait variables. Additional tests included the timed up and go and step test.

### Results:

Participants were a mean±SD age 62±14 years, 57% male, 28±12 days post stroke. The absolute asymmetry was 56.0±6.7% body weight during static standing and 55.9±5.0% peak force during sit-to-stand. Static and sit-to-stand asymmetry had fair strength correlations (Spearman's) with gait speed, timed up and go, step test, step length asymmetry and mediolateral centre of pressure velocity (r = 0.26-0.39; p < 0.05). With a subgroup analysis including those with greater than 53% asymmetry towards the less-affected side, static correlations remained fair (r = 0.40-0.47; n = 32); and sit-to-stand asymmetry was moderately correlated with the step test (r = 0.55; n = 41) and fairly correlated with other variables (r = 0.36-0.49), apart from centre of pressure velocity (p > 0.05).

### Conclusion/Key Practice Points:

- Weight-bearing asymmetry during static standing and sit-to-stand had fair strength correlations with balance and mobility following stroke.
- Stronger correlations were demonstrated in subgroups bearing more weight on the less-affected side.
- Future research in a cohort with greater asymmetry may result in more significant findings.

## COLLABORATIVE DESIGN OF A VIRTUAL COMMUNITY: ENGAGING STUDENTS THROUGH ONLINE SIMULATION

**Breheny L<sup>1</sup>**

<sup>1</sup>Notre Dame University, Dorset Road Northbridge, Australia

R5-11, Meeting Room C4.2, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

'Riverina Shore' is a virtual community which has been developed within the School of Community Health, Charles Sturt University, as an online learning resource for students. The virtual community is presented as an attractive webpage in which client scenarios are embedded in a range of community places and spaces

### Design:

This project used activity theory to inform the process of interdisciplinary collaboration between diverse groups of practitioners to create a virtual community. A reimagining of the academic hierarchy facilitated effective collaboration between media technologists, educational designers, practitioners and academics to enable the development of authentic resources.

#### Method:

The value of Riverina Shore as a virtual community is the participation of real people in the development of the audio-visual resources. Participants were invited to tell their unscripted story in authentic contexts. Simulation scenarios must be truly contextual, reflecting real life tensions and issues which people cope with on a daily basis.

#### Results:

Evaluation survey feedback collected from students, practitioners and academics clearly demonstrates the value of these authentic narratives in facilitating critical thinking, clinical reasoning and visualising opportunities for inter-professional practice.

#### Conclusions:

The learning benefits of these authentic scenarios in which students can see clearly the connections between person – family – environments – occupation, may be more extensive than is possible through the use of digital stories. This virtual community could be used effectively to help prepare students for workplace learning experiences, as well as the opportunity to collaborate with disciplines such as education, business, social science and agriculture.

### TELEREHABILITATION IN THE ADVANCED PRACTICE PHYSIOTHERAPY ASSESSMENT OF PATIENTS WITH CHRONIC MUSCULOSKELETAL CONDITIONS: A VALIDATION STUDY.

**Cottrell M<sup>1</sup>**, O'Leary S<sup>1,2</sup>, Swete Kelly P<sup>2</sup>, Elwell B<sup>3</sup>, Hess S<sup>2</sup>, Litchfield M<sup>2</sup>, McLoughlin I<sup>3</sup>, Tweedy R<sup>2</sup>, Raymer M<sup>2,4</sup>, Hill A<sup>1</sup>, Russell T<sup>1</sup>

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R5-11, Meeting Room C4.2, October 21, 2017, 1:45 PM - 2:30 PM

#### Aim:

To determine if telerehabilitation is a valid medium for the assessment of patients with chronic musculoskeletal conditions referred to an advanced practice physiotherapy screening clinic when compared to conventional in-person assessment.

#### Design:

A repeated-measures study design.

#### Method:

43 participants with chronic musculoskeletal conditions were recruited from tertiary physiotherapy screening clinic wait lists. Assessments (in-person, telerehabilitation) were undertaken by two independent advanced practice Musculoskeletal Physiotherapists within a single session. Primary outcome of interest was the level of agreement between assessments regarding key clinical management decisions, including recommended management pathways and referral to specific allied health professions for non-surgical management. Secondary outcome measures included the level of agreement for clinical diagnostics, contributing factors and the requirement for further investigations. Agreement between assessments were analysed using percentage agreement and prevalence-adjusted bias-adjusted kappa (PABAK) statistics.

#### Results:

Substantial agreement (PABAK = 0.67) between the two mediums was reached for recommended management pathways, whilst moderate to near perfect agreement (PABAK = 0.52 to 0.86) was reached to referral to individual allied health professions. There was substantial agreement for clinical diagnoses (83%) and the request for further investigations (PABAK = 0.67). There were varying levels of agreement (PABAK = 0.29 to 0.95) in identifying mechanisms that contribute to a patient's overall clinical presentation.

#### Conclusions/Key Practice Points:

- Telerehabilitation is valid in the assessment of patients with chronic musculoskeletal conditions.
- Telerehabilitation may be an alternative method of service delivery, for patients who have difficulty in attending these screening clinics in person.

## FEASIBILITY AND ACCEPTABILITY OF USING A COMPUTER TABLET TO MONITOR AN UPPER LIMB HOME EXERCISE PROGRAM COMPLETED BY STROKE PATIENTS

**Levy T<sup>1</sup>**

<sup>1</sup>Repatiation General Hospital, Daw Park, Australia, <sup>2</sup>Flinders University, Bedford Park, Australia

R5-11, Meeting Room C4.2, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

To evaluate the feasibility and acceptability of using an iPad to monitor the amount of upper limb practice completed by stroke patients prescribed with a home program and to explore factors that influence adherence.

### Design:

Case series, n=10

### Method:

Ten consecutive subjects randomised to the intervention arm of a randomised controlled trial investigating therapy after spasticity management for stroke patients (ACTRN 12615000616572) were recruited for this substudy. Participants were asked to perform and record a prescribed 60-minute upper limb program on an iPad daily. Exercises were based on the Graded Arm Supplementary Program. Four randomly selected recorded sessions for each participant were analysed by the physiotherapist to assess adherence to amount of exercise and content. The Self-efficacy for Exercise Scale, Perceived Social Support for Exercise Scale, Social Support for Exercise Scale, Adherence for Exercise Scale for Older People and System Usability Scale were administered to evaluate factors which influence adherence.

### Results:

Participants performed exercises on average for 50.32 minutes (range 26.42-68.37). Self-reported practice time was 59.44 minutes (range 48-67.5). Mean number of repetitions was 154.80 (range 71-388). Higher levels of social support for exercise from family correlated with amount of exercise performed ( $r=.850$ ). Mean score for the System Usability Scale was 85.5 (range 47.5-100) indicating participants were accepting of the technology.

### Conclusion/ Key Practice Points:

- Monitoring of patient practice using an iPad is feasible and may prove more reliable than self-report.
- There is variability in the amount of upper limb exercise stroke patients do at home .

## VALIDITY OF THE VIMOVE WEARABLE MOTION SENSOR SYSTEM FOR THE MEASUREMENT OF KNEE VALGUS/VARUS DURING A SINGLE LEG SQUAT

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R5-11, Meeting Room C4.2, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

To investigate the validity of a wearable motion sensor system for measurements of knee valgus/varus in healthy adults during single leg squat.

### Design:

Descriptive laboratory study

### Method:

Healthy adults [n=27, 14 males; 28(5) years old, 66.2(12.5) kg, 170.8 (10) cm] participated in this study. A single gyroscope/accelerometer sensor placed on each tibia proximally (ViMove, DorsaVi Ltd, Melbourne) and a 14 camera 3D motion analysis system (Motion Analysis Corporation, USA) were used concomitantly to measure knee frontal plane motion (primary outcome) during the squat. Ten single leg squat repetitions were performed and the 5th repetition of each participant was used for statistical analysis. Pearson correlation

coefficients were used to determine associations between the 3D motion analysis system and ViMove measures and concurrent validity was assessed by calculating the mean differences and the 95% limits of agreement (LOA) using the Bland-Altman method.

#### Results:

The ViMove system presented no correlation with the 3D motion analysis system ( $r = 0.270$ ,  $p=0.174$ ) and the Bland-Altman plots revealed poor agreement between the two tools with a mean difference of  $7.43^\circ$  and 95%LOA:  $-14.3^\circ$  to  $29.2^\circ$ .

#### Conclusion/Key Practice Points:

- Our findings demonstrated large differences in knee frontal plane motion measurements during a single leg squat between the ViMove and the 3D motion analysis systems (gold standard). Improvements in the algorithms or sensor accuracy may result in more acceptable error of this wearable device in the future.

### NOVEL EXERCISE VIDEO INTERVENTION IMPROVES REHABILITATION OUTCOMES OF TOTAL KNEE REPLACEMENT PATIENTS

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R5-11, Meeting Room C4.2, October 21, 2017, 1:45 PM - 2:30 PM

#### Aim:

To determine whether a novel exercise video intervention improves rehabilitation outcomes after total knee replacement (TKR) surgery upon discharge and length of stay (LOS).

#### Design:

Clinical trial to find out the effectiveness of exercise video intervention.

#### Method:

We recruited two groups of patients; patients undergoing a standard TKR rehabilitation program ( $n = 37$ ) and patients undergoing the exercise video intervention plus the standard program ( $n = 24$ ). The intervention involves staff nurses providing patients with an iPad to watch exercise videos and perform them during their hospital stay once a day. Clinical outcomes were assessed by physiotherapists upon discharge (pain level, passive knee flexion range of motion [ROM], passive knee extension ROM) and LOS was recorded. Twenty patients in the intervention group were surveyed to find out their motivation and confidence level.

#### Results:

Passive knee flexion ROM of intervention group (mean =  $92.50$ ) was significantly higher than the control group (mean =  $85.27$ ,  $p = 0.030$ ). However, there was no statistically significant difference between the two groups for passive knee extension ROM, pain level, and LOS. TKR patients felt more motivated ( $p < 0.0001$ ) and confident ( $p = 0.046$ ) to do exercises with the video compared to the conventional way (an exercise booklet).

#### Conclusion/Key Practice Points:

- By using innovative technology, an exercise video intervention is able to engage patients in doing their exercises during their free time. This led to the improvement of passive knee flexion ROM upon discharge and increased patients' motivation and confidence level to do exercises.

## AMOUNT (ACTIVITY AND MOBILITY USING TECHNOLOGY) REHABILITATION TRIAL: FACTORS INFLUENCING RECRUITMENT IN PEOPLE UNDERTAKING INPATIENT REHABILITATION

**van den Berg M<sup>1</sup>**, Hassett L<sup>2,3</sup>, Weber H<sup>1</sup>, Chagpar S<sup>2</sup>, Dakopoulus A<sup>1</sup>, Rabie A<sup>4</sup>, Moran F<sup>2</sup>, Wong S<sup>4</sup>, Crotty M<sup>1</sup>, Crotty M<sup>2</sup>

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R5-11, Meeting Room C4.2, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

To describe factors associated with inpatient recruitment for the AMOUNT rehabilitation trial, a study that aims to evaluate the effectiveness of using affordable technologies in addition to usual care to improve mobility and physical activity for patients in aged care and neurological rehabilitation.

### Design:

Baseline observation following successful recruitment completion.

### Method:

Newly admitted patients to three metropolitan rehabilitation units were screened for eligibility: aged  $\geq 18$  years; reduced mobility; capacity for mobility improvement; life expectancy  $>12$  months; length of stay (LOS)  $\geq 10$  days; adequate cognition and vision; and anticipated discharge destination home.

### Results:

A total of 716 (14%) of the 5039 screened patients were eligible of which 300 (42%) consented and were randomised. Main reasons for exclusion were anticipated LOS  $<10$  days when meeting other criteria (37%), insufficient cognition (16%) and no capacity for mobility improvement (10%). Main reasons for declining participation were feeling overwhelmed (24%), no interest in extra exercise (21%) and too busy for 6-month trial-commitment (12%). Participants had a mean age of  $74 \pm 14$  years, 50% was male, 54% had a neurological condition, 71% were unrestricted community walkers prior to admission, and 39% reported nil technology exposure prior to trial commencement. Baseline assessment demonstrated reduced mobility (mean SPPB  $4.2/12 \pm 2.6$ ): 86% completed the 4-metre timed walk, mean  $11.6 \pm 9.2$  seconds, and mean upright time measured with activPAL was  $111.2 \pm 89.7$  minutes/day.

### Conclusion:

The results suggest that gender, condition, activity levels, and prior exposure to technology do not adversely affect patients' decision to participate in a technology-based exercise trial.

## WEARABLE PHYSICAL ACTIVITY TRACKERS: ACCURACY OF MONITORING STEP COUNT IN PEOPLE WITH PARKINSON'S DISEASE

**Daniel H<sup>1</sup>**, Payne C<sup>1</sup>, Brauer S<sup>1</sup>, Lamont R<sup>1</sup>

<sup>1</sup>The University of Queensland, St Lucia, Australia

R5-11, Meeting Room C4.2, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

Despite known benefits of physical activity, people with Parkinson's disease may need motivation and tools to assist in increasing activity levels. Gait characteristics may affect the accuracy of wearable activity trackers in this population. The aim of this study was to determine the accuracy of the Fitbit Charge HRTM and Garmin Vivosmart® HR in measuring steps in people with Parkinson's disease.

### Design:

Cross-sectional observational study

### Methods:

Thirty-three people with mild-moderate Parkinson's disease performed six, two-minute indoor walks at their self-selected walking pace, and at target cadences of 60, 80, 100, 120 and 140 beats/minute. A 500m

outdoor walk with terrain challenges was also performed. Step count was recorded by the two wrist-worn activity trackers (Fitbit and Garmin) and compared to an accelerometer (ActivPAL3™).

#### Results:

Both activity trackers had low error (1-7%) and moderate to high consistency at self-selected pace both indoors (ICC 0.51-0.77;  $p < 0.05$ ) and outdoors (ICC 0.78-1.0;  $p < 0.05$ ) compared to the ActivPAL3™. The Garmin recorded low error (<5%) and high agreement (ICCs >0.70;  $p < 0.001$ ) for all cadences >80 steps/minute. The Fitbit had high error (>10%) and low consistency for all cadences except 100-120 steps/minute. Both recorded high error at 60 steps/min.

#### Conclusion:

The Fitbit Charge HRTM and Garmin vivosmart® HR are accurate in recording steps at self-selected walking speeds indoors or outdoors in people with mild-moderate Parkinson's disease. The Garmin vivosmart® HR is more accurate at a variety of cadences above 60 beats/minute.

### NECK FUNCTION IN FIRST CLASS CRICKETERS: RANGE OF MOTION AND PROPRIOCEPTION

**Reid S<sup>1</sup>**, Fornasier J<sup>1</sup>, Redrup D<sup>2</sup>

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SPA11A, Meeting Room C4.1, October 21, 2017, 1:45 PM - 2:30 PM

#### Aim:

To investigate whether first class cricketers have differences in cervical spine rotation range of motion and proprioception left to right and to normative data.

#### Design:

A single group observational study during the cricket pre-season and post-season.

#### Methods:

Thirty-one male first class cricketers (18-35 years) participated. Demographic information and relevant medical history was collected. Range of motion was measured three times with a cervical range of motion device. Proprioception was assessed using the joint position laser method of Revel, six times to both straight ahead and 80% of maximum rotation.

#### Results:

Mean right rotation (72.5°) was 2.4° less than mean left rotation (74.9°) ( $p = 0.06$ ) which could be related to 55% of players being right handed batsmen with their neck in left rotation. Cricketers had 6.5° less right rotation and 4.1° less left rotation than normal (79°) (both  $p < 0.001$ ). There was no change in range of motion post season. For head repositioning error, there was no difference left to right for both protocols. In the preseason, 26% of cricketers had mean head repositioning error greater than 4.5° (the threshold value of abnormal positioning), which is greater than 20% of healthy normals. Post-season 17% of cricketers had head repositioning error greater than 4.5°.

#### Conclusions:

First class cricketers have asymmetry and deficits in cervical ROM. Some cricketers have poor cervical proprioception; however this improves throughout the season. Identifying impairments or asymmetry may guide cervical spine interventions which have been shown to facilitate concussion recovery and injury prevention.

## AN INVESTIGATION OF POTENTIAL FACTORS LEADING TO SHOULDER INJURY IN ADOLESCENT RUGBY UNION PLAYERS: A RETROSPECTIVE COHORT STUDY

**Cochrane K<sup>1</sup>**, Butler J<sup>2</sup>, Rowland T<sup>3</sup>

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SPA11A, Meeting Room C4.1, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

To investigate the association between potential factors that may lead to shoulder injury in adolescent male rugby union players.

### Design:

Retrospective cohort study.

### Method:

A self-administered questionnaire consisting of 10 standardised questions was used to investigate the incidence of shoulder injury in adolescent male rugby union players. Participants had previously partaken in a study by Rowland et al., 2017 investigating shoulder range of motion, strength and generalised joint hypermobility. Data from the previous and current study was correlated in order to determine the relationship between the aforementioned variables and shoulder stability.

### Results:

Twenty three (23) participants completed the questionnaire with nine participants (39%) reporting a shoulder injury. No statistically significant association was found between shoulder injury and generalised joint hypermobility ( $p=0.32$ ), average shoulder range of motion ( $p=0.38$ ), body mass index ( $p=0.60$ ) or hand dominance ( $p=0.53$ ). A statistically significant association was observed between shoulder injury and shoulder muscle strength ( $p=0.04$ ). Similarly, a statistically significant association was found between left shoulder flexion strength ( $p=0.03$ ), right shoulder flexion ( $p=0.03$ ), left shoulder abduction ( $p=0.03$ ) and right shoulder internal rotation at 90 degrees abduction ( $p=0.008$ ).

### Conclusion/Key Practice Points:

- Reduced strength of the shoulder musculature appears to be associated with an increased risk of sustaining a shoulder injury in this population.
- It is inconclusive if overall generalised joint hypermobility and increased active shoulder ranges of motion are associated with shoulder injury.
- Further investigations are required to determine if muscle strengthening programs are effective in reducing shoulder injuries.

## ELECTROMYOGRAPHIC ACTIVITY OF THE SHOULDER MUSCLES DURING REHABILITATION EXERCISES IN SUBJECTS WITH AND WITHOUT SUB-ACROMIAL PAIN SYNDROME: A SYSTEMATIC REVIEW

**Kinsella R<sup>1,2</sup>**, Pizzari T<sup>1</sup>

<sup>1</sup>La Trobe University, Corio, Australia, <sup>2</sup>St Vincent's Hospital, Corio, Australia

SPA11A, Meeting Room C4.1, October 21, 2017, 1:45 PM - 2:30 PM

### Aim:

Shoulder disorders are a leading cause of pain and disability with subacromial pain syndrome (SPS) including rotator cuff pathology, the most common of all shoulder diagnoses reported by general practitioners. Altered activation of the scapular and rotator cuff muscles in patients presenting with SPS is postulated to contribute to its development and progression. Consistent deviations in shoulder electromyography (EMG) muscle activity and timing have not, however, been identified. The aim of this review was to determine whether definitive evidence exists of differences in EMG characteristics in subjects diagnosed with SPS compared to healthy controls.

Design:  
Systematic review.

Method:  
Six key databases were searched - MEDLINE, EMBASE, CINAHL, SPORTdiscus, PEDro and The Cochrane Library (inception to May 2016). The search yielded 1414 records using terms relating to shoulder impingement, EMG, scapular and rotator cuff muscles. Twenty-two papers remained once duplicates were removed and selection criteria applied. Data extraction, quality assessment and data synthesis were performed. Effect sizes and 95% confidence intervals were calculated.

Results:  
For the majority of muscles, regardless of task, load or arm position, significant differences were not demonstrated or results were contradictory. There was some limited evidence that serratus anterior has lower amplitude, delayed activation and earlier termination in SPS participants.

Conclusion/Key-Practice Points:

- Alterations in muscle activity in subjects with SPS does not appear to be uniform. Rehabilitation approaches should be similarly individualised.
- Addressing aberrant movement patterns and facilitating balanced activation of all shoulder muscles may be a more appropriate treatment direction for the future.

## CONCUSSION CONSENSUS STATEMENT

**Makdissi M**

SPA11B, Meeting Room C4.4, October 21, 2017, 1:45 PM - 2:30 PM

The 5th international conference on concussion in sport was held in Berlin in October 2016. From this meeting, an updated consensus statement was developed, based on detailed review of the current literature and expert opinion. The consensus statement was developed to inform clinicians managing sports-related concussion at the elite, sub elite and community-level of sport. Dr Makdissi will present an overview of the process, and documents arising from the meeting, with a focus on the aspects of concussion management, including: Recognise; Remove; Re-evaluate; Rest; Rehabilitation; Refer; Recover; Return to sport; Reconsider; Residual effects and sequelae; and Risk reduction.

## ANKLE CONSENSUS STATEMENT

**Delahunt E**

SPA11B, Meeting Room C4.4, October 21, 2017, 1:45 PM - 2:30 PM

Prior to the development and implementation of effective management protocols for lateral ankle sprain injury, it is pertinent that a best practice, evidence-based approach in the clinical assessment of lateral ankle sprain injury must first be established. Second to diagnosis of the acute injury, the aims of the clinical assessment must address any aberrant deficiencies. Identifying the presence or absence of mechanical and sensorimotor impairments in the initial clinical assessment may provide important information as to whether the patient is at an increased risk for the development of chronic ankle instability following their acute injury. Additionally, a structured clinical assessment guideline that assesses for these impairments can be subsequently used to ensure that the patient undertakes a more efficient and appropriate management pathway. It is plausible that a more robust rehabilitation protocol, may in turn, reduce the likelihood of the development of the long-term sequelae associated with chronic ankle instability.

Developing structured, best practice, evidence-based guidelines for the clinical assessment of lateral ankle sprain injury could be achieved by a systematic expert opinion approach. Dr Delahunt will summarise and describe this approach for the development of an international and multi-disciplinary consensus on the clinical assessment of acute lateral ankle sprain injury. This may help clinicians identify anomalous mechanical and sensorimotor impairments known to contribute to the development of chronic ankle instability.

## RECOMMENDED PHYSICAL INTERVENTIONS FOR PATELLOFEMORAL PAIN: CONSENSUS STATEMENT FROM THE 2017 INTERNATIONAL PATELLOFEMORAL PAIN RESEARCH RETREAT

**Collins N<sup>1</sup>**

<sup>1</sup>*The University of Queensland, St Lucia, Australia*

SPA11B, Meeting Room C4.4, October 21, 2017, 1:45 PM - 2:30 PM

The International Patellofemoral Research Network (iPFRN) is a group of researchers and clinicians with a specific interest in patellofemoral pain across the lifespan. The group meets every two years at the International Patellofemoral Pain Research Retreat, to share the latest patellofemoral pain research developments, discuss the literature to formulate consensus statements to disseminate knowledge, and develop a future research agenda for patellofemoral pain. The 5th Retreat was held on the Gold Coast, Australia, in July 2017, with 52 attendees from 10 countries. This presentation will summarise outcomes of the consensus discussions on recommended physical interventions for patellofemoral pain, incorporating exercise, taping, bracing, foot orthoses, combined interventions, and adjunct interventions. It will provide physiotherapists with the most up-to-date recommendations for management of patellofemoral pain, integrating the highest quality evidence with expert opinion.

## PELVIC PAIN AUDIT

**Evans S<sup>1</sup>**

<sup>1</sup>*Pelvic Pain Foundation of Australia, Australia*

WMPH11, October 21, 2017, 1:45 PM - 2:30 PM

Women with pelvic pain commonly have a range of disparate pain symptoms. As health professionals, we all have clinical areas that we feel more or less comfortable managing. However, with no health professionals leaving their training fully competent to manage all aspects of pelvic pain, it is easy for patient care to become disjointed. A physiotherapist may be her first or her tenth health professional encounter. To make an impact on the vast need for pelvic pain care, learning outside our primary discipline is essential.

The Clinical Audit looks at the symptom profiles of 168 consecutive women referred for gynaecological care of dysmenorrhea. It describes the frequency of additional, non-menstrual symptoms, developing the concept of a Pelvic Pain Syndrome. The audit complements a retrospective review of the development of persistent pelvic pain following dysmenorrhea in a separate 100 women cohort. It also considers the difference in clinical presentation between women with and without a previous diagnosis of endometriosis. So, whether your patient is an older woman with bladder and back pain, or a younger woman with fibromyalgia, dysmenorrhea may have had a role, and Pelvic Pain Syndrome may be present. The results are of direct interest to physiotherapists, who are well placed to become experts in non-surgical management of most pelvic pain symptoms.

Key Practice Points: This presentations provides:

- An understanding of the additional symptoms commonly present in women with dysmenorrhea (past or present), and their frequency
- An understanding of how a previous diagnosis of endometriosis affects the clinical presentation.

## UNDERSTANDING PELVIC PAIN

**Evans S<sup>1</sup>**

<sup>1</sup>*Pelvic Pain Foundation of Australia, Australia*

WMPH11, October 21, 2017, 1:45 PM - 2:30 PM

From a health professional's perspective, it's easy to feel overwhelmed. So many symptoms! Where should I start? How can painful periods, back pain, headaches, fatigue, overactive bladder, IBS, nausea, food intolerance, poor sleep, anxiety, low mood and dizziness possibly be related to each other? Hmmm. Surely there's someone else on today that they could see.....

From the patient's perspective, worry regarding the underlying cause of undiagnosed pain can too easily lead to 'the unknown' being replaced with 'the awful'.

Actually, pelvic pain isn't that hard. And it can be streamlined, to allow effective diagnosis, assessment and management time effectively. It's just a matter of understanding the big picture. There is a large, indispensable and increasing role for physiotherapists in the management of pelvic pain.

Key Practice Points: This presentations provides:

- An understanding of how persistent pelvic pain develops, even when it has been present long term
- Specific symptoms and examination findings to allow you to become more confident diagnosing your patient's pain.
- A practical approach to planning management.

## CLINICAL ASSESSMENT OF WOMEN WITH PELVIC PAIN

**Chalmers J<sup>1,2</sup>**, Catley M<sup>2</sup>, Evans S<sup>3</sup>, Moseley L<sup>2</sup>

<sup>1</sup>Western Sydney University, Sydney, Australia, <sup>2</sup>University of South Australia, Adelaide, Australia, <sup>3</sup>The Pelvic Pain Foundation of Australia, Adelaide, Australia

WMPH11, October 21, 2017, 1:45 PM - 2:30 PM

Aim:

To develop a questionnaire that assesses the impact of pelvic pain on women, regardless of diagnosis, that is consumer-driven, has high utility, sound psychometric performance, easy scoring, and high reliability.

Design:

Study 1: Delphi study; Study 2: cross-sectional study

Method:

Studies 1 and 2 used female participants with pelvic pain. Participants were eligible to participate regardless of whether their pelvic pain was undiagnosed, self-diagnosed, or diagnosed by a clinician. Study 1 used a 3-round "patient-as-expert" Delphi technique (n = 443) to identify the top 10 aspects of life with the self-reported greatest impact in women with pelvic pain. These 10 items formed the questionnaire. In Study 2 participants filled in the questionnaire once, and Rasch analysis was used to assess the psychometric properties of the questionnaire (n = 1203).

Results:

The Pelvic Pain Impact Questionnaire (PPIQ) consists of 10 items rated on a 5-point Likert scale. The first 8 questions can be summed to give a total 'impact score', with the final 2 questions being supplemental. Rasch analysis revealed the PPIQ targets the pelvic pain population well, constitutes a unidimensional scale, demonstrates internal consistency, and has high reliability (ICC: 0.91, p<0.001).

Conclusion/Key Practice Points:

- The PPIQ is a sound tool to assess the life impact of pelvic pain.
- It uses patient-generated language, is easily administered and scored, and has strong psychometric properties.
- The PPIQ is suitable for both clinical and research settings.

## YEAR IN REVIEW - PULMONARY REHABILITATION AND EXERCISE PRESCRIPTION

**Singh S<sup>1</sup>**

<sup>1</sup>University Hospitals of Leicester NHS Trust, Leicester, United Kingdom

CRP12, Meeting Room C4.8, October 21, 2017, 2:35 PM - 3:20 PM

Pulmonary rehabilitation is internationally recognized as an important intervention for individuals with COPD. A key component of the intervention is the exercise component. It is important that this is prescribed in accordance with recognized guidelines and progressed according to maximize the gains from rehabilitation. In 2017 there have been a number of important publications looking at expanding the scope of pulmonary

rehabilitation which will help develop the service delivery of rehabilitation to offer a different approach to those unable or unwilling to attend centre based programmes. During this session I will discuss two studies that looked at home based exercise prescription and a third paper that looked to supplement rehabilitation with a physical activity intervention. These three studies are important, well conducted studies that attempt to advance the delivery of pulmonary rehabilitation.

## CURRENT AND EMERGING RESEARCH IN THE CARE OF PEOPLE LIVING WITH DEMENTIA

**Comans T<sup>1</sup>**

*<sup>1</sup>Menzies Health Institute Queensland, Griffith University, Brisbane, Australia*

GPA12, Meeting Room C3.6, October 21, 2017, 2:35 PM - 3:20 PM

### Background:

The NHMRC Partnership Centre: Dealing with Cognitive and Related Functional Decline in Older People (Cognitive Decline Partnership Centre) aims to improve the lives of people with dementia by developing, communicating, and implementing research that improves care. Current and completed research has included; Understanding risk and preventing falls and functional decline in older people with cognitive impairment; Care of Older Persons in their Environments (COPE) in the Australian health context, and improving cognitive and functional capacity of older people with dementia in residential aged care through an exercise prescription approach.

Quality of life measurement is an important outcome of any program of care. Health economics requires a particular type of quality of life tool that has preference weights attached. The most commonly used preference based quality of life tools are generic with the most well known being EQ-5D. These tools have a number of limitations. Older people's preferences may change as they age and generic measures may not include domains that become more important for older people. Diseases like dementia which are more common as we age may be particularly compromised as people may value constructs such as relationship and place over physical function.

### Objectives:

This presentation will 1) present current research happening in Australia around dementia care that is relevant to physiotherapists and 2) discuss the current limitations in using quality of life tools for older people and present preliminary findings on research being conducted measuring the quality of life of people living with dementia.

### Key Practice Points:

- Physiotherapists are likely to be increasingly involved in the care of people living with dementia as the population ages and as people want to remain living independently for longer with dementia.
- Understanding the key components of quality of life that are important to people will enable programs of care to be developed that focus on maintaining quality of life in people living with dementia.

## CHALLENGING PHYSIOTHERAPY IN RESIDENTIAL AGED CARE: MOVING AWAY FROM PAIN MANAGEMENT TO EXERCISE, FALLS PREVENTION, AND RE-ABLEMENT.

**Hewitt J<sup>1,2</sup>**, Refshauge K<sup>2</sup>, Goodall S<sup>3</sup>, Henwood T<sup>4</sup>, Clemson L<sup>2</sup>

*<sup>1</sup>Feros Care, Kingscliff, Australia, <sup>2</sup>The University of Sydney, Lidcombe, Australia, <sup>3</sup>CHERE, The University of Technology, Sydney, Australia, <sup>4</sup>AgeFit Solutions, Brisbane, Australia*

GPA12, Meeting Room C3.6, October 21, 2017, 2:35 PM - 3:20 PM

### Aim:

Under the current Aged Care Funding Instrument, physiotherapy services in Australian residential aged care are limited to TENS and massage. These techniques are out of line with best practice recommendations and do not address falls, mobility restriction, or quality of life. The aim of the current study was to test the efficacy of the "Sunbeam Program". The hypothesis was that this physiotherapist guided, individualised, progressive resistance and balance program would reduce falls, improve mobility, and quality of life, and be a cost effective option.

**Design:**

A single blinded, two group cluster randomized trial was performed.

**Method:**

20 residents living in 16 aged care facilities (clusters) participated in the trial. Clusters were randomized to either “intervention” or “usual care”. The intervention consisted of 50 hours of progressive resistance and balance training under the guidance of a physiotherapist over a 6 month period, followed by a facility-guided maintenance training program for 6 months. Clusters randomized to the usual care group continued with their usual activity programs. Outcome measurements were taken at baseline, six and twelve months.

**Results:**

Statistical analyses are currently underway and the paper being prepared for submission to an international peer reviewed journal. The study reports evidence that The Sunbeam Program reduced falls and fall rates, functional mobility also improved.

**Conclusion:**

This trial will be used to inform policy makers about challenging current funding models. The program is the first of its kind to return strong evidence for physiotherapy’s potential to improve outcomes for residents of aged care.

## KEY EDUCATION AND EXERCISE APPROACHES FOR EFFECTIVE MANAGEMENT OF LATERAL HIP PAIN

**Grimaldi A<sup>1,2</sup>**, Vicenzino B<sup>2</sup>, Mellor R<sup>2</sup>

<sup>1</sup>Physiotec, Tarragindi, Australia, <sup>2</sup>The University of Queensland, School of Health and Rehabilitation Sciences: Physiotherapy, Brisbane, Australia

MPA12A, Meeting Room C3.4, October 21, 2017, 2:35 PM - 3:20 PM

**Background:**

Gluteus medius and minimus tendinopathy can be considered a load related condition in which inappropriate compressive and/or tensile loads disrupt the fine homeostatic balance between catabolic and anabolic processes. Excessive compression can occur through non-modifiable structural factors and potentially modifiable factors, which contribute to an adducted hip position. In this position, the tendons are compressed against the greater trochanter by both joint angulation and overlying fascial structures. Excessive tensile loading might occur through high load/speed stretch shortening cyclical movements. Successful rehabilitation must address these modifiable load related factors and will be the focus of this workshop.

**Aims/objectives:**

To present a management protocol for lateral hip pain that was designed on biologically sound principles and shown to be efficacious in a recent randomised clinical trial. Upon completion of this workshop, participants should be able to provide clear load management advice and develop an exercise program for managing gluteal tendinopathy.

**Approach:**

This workshop will include a mix of presentation, discussion and directed/supervised practice of some key exercises. Load management advice and principles of exercises for managing gluteal tendinopathy will be presented and discussed.

**Key Practice Points:**

- Avoidance of inappropriate compressive and tensile tendon loading is imperative in rehabilitating patients with gluteal tendinopathy
- Exercises that involve tendon compression should be avoided eg., iliotibial band stretches
- Isometric and heavy slow loading isotonic exercises for gluteus medius and minimus will strengthen these muscles and assist with pain relief
- Integrating strength gains into function is achieved by specifically retraining movement patterns.

## HOW TO MANAGE THE 'BIO' IN THE BIOPSYCHOSOCIAL – MULTIFACETED MUSCULOSKELETAL PROBLEMS AS A CONSEQUENCE OF LONG STANDING KNEE PAIN

**McConnell J**

MPA12A, Meeting Room C3.4, October 21, 2017, 2:35 PM - 3:20 PM

The physiotherapist is in a unique and privileged position, because unlike in many other health care professions the physiotherapist has a license to touch. With this comes a huge responsibility, as the patient will often share their inner most secrets and fears, so it is the physiotherapist's mission to improve the patient's symptoms and at the same time allay their fears. This presentation will examine how to manage the complex, chronic, long-term musculoskeletal patient. It will explore the issues of patient education and empowerment and discuss strategies to improve patient compliance.

### Key Practice Points

- Improve initial patient education by physiotherapists
- Outline treatment strategies to improve lower limb loading with emphasis on patient self-management
- Understand compliance to treatment issues and explore some strategies to improve compliance.

## HOW TO SCREEN FOR CERVICAL, VESTIBULAR AND OCULAR DEFICITS POST CONCUSSION

**Treleaven J<sup>1</sup>**

<sup>1</sup>Neck Pain and Whiplash Research Unit, Ccre Spine University of Qld, St Lucia, Australia

MPA12B, Meeting Room C4.3, October 21, 2017, 2:35 PM - 3:20 PM

### Background:

Symptoms of headache, dizziness, visual disturbances and neck pain are common post concussion and may be cervical, vestibular or ocular in nature.

### Aims / objectives:

The aim of the session is to provide examples of evidenced based assessments that can be used to screen for cervical, vestibular and ocular deficits post concussion in order to identify the potential systems involved in the production of the symptoms. This will assist directions for appropriate further assessment and or prompt referral to other professionals for full assessment and management if required.

### Approach:

Participants will have an opportunity to observe and then practice some of these in a small group environment with feedback from the instructor. Written handouts will be provided.

### Key Practice Points:

- Therapists will have observed assessments that can be used to screen for cervical, vestibular and ocular deficits post concussion in order to identify potential systems involved in production of the symptoms.
- Therapists will have had an opportunity to practice some of these and be given some feedback on these tasks.
- Written handouts and supplementary material to assist the screening assessment will be provided.
- This workshop should give therapists confidence to apply this screening approach when assessing patients with symptoms post concussion.

## THE “WHEN AND HOW” OF JOINT HYPERMOBILITY: IMPLEMENTING AND PERFECTING THE USE OF NEW ASSESSMENT TOOLS FOR TOMORROW'S CLINICAL PRACTICE

**Nicholson L<sup>1</sup>**, Chan C<sup>1</sup>

<sup>1</sup>*The University of Sydney, Camperdown, Australia*

MPA12C, Meeting Room C4.6, October 21, 2017, 2:35 PM - 3:20 PM

### Background:

The 9-item Beighton scale is traditionally used to quantify the extent of generalised joint hypermobility. The tests are poorly standardised, use varying cut-points, over-represent the upper limb, and are all physiological movements performed in the sagittal plane. The 12-item Lower Limb Assessment Scale first reported in 2005 has gained traction in the literature, but not yet in musculoskeletal practice. We have designed the Upper Limb Hypermobility Assessment Tool an analogue of the Lower Limb Assessment Scale. Both tools comprise physiological and accessory joint tests in multiple planes and are currently used in various screening programs.

### Aims/objectives:

The aims are to improve participants' i). knowledge regarding standardised testing and the reliability, validity and clinical applicability of the Beighton, Lower and Upper limb hypermobility tools and indications for the use of these tools ii) skilled performance of the tests and iii) clinical reasoning in the assessment and interpretation of results.

### Approach:

The session will begin with a lecture to acquaint participants with the rationale for the tests (10mins) followed by practical demonstration of the tests (10mins). Participants will then practice the least-familiar tests with feedback (20mins) followed by a short time for questions (5 mins). Learning materials provided include a manual on how to perform these tests.

### Conclusion/Key Practice Points:

- Participants will understand to the importance of accurate performance of hypermobility tests, their indications for use and what the results mean to the prevention of injury and management of patients affected.
- Participants will gain new manual hypermobility assessment skills.

## MANUAL THERAPY: WHERE ARE WE GOING?

**Bialosky J<sup>1</sup>**

<sup>1</sup>*University of Florida, Gainesville, United States*

MPA12D, Meeting Room C4.5, October 21, 2017, 2:35 PM - 3:20 PM

The continued use of manual therapy in clinical practice has been questioned with some arguing for active interventions and self management approaches. This presentation will argue for a reconceptualization in both the evaluative approach and application of manual therapy interventions. Manual therapy has a role in the current management of patients presenting with musculoskeletal pain complaints; however, traditional approaches have not kept pace with the current understanding of pain. Manual therapy practitioners and educators must adapt to the current understanding of pain in order to remain relevant in the healthcare environment.

### Key Practice Points This session will contribute to participants' practice

- Conceptualizing manual therapy as an important intervention in current physical therapy practice
- Describing manual therapy approaches in the framework of current understanding of pain processing
- Describing mechanistic based approaches to identifying manual therapy responders.

## EXPERT OPINION TO IMPROVE BELIEVABILITY OF SHAMS FOR PHYSICAL TREATMENTS: A DELPHI SURVEY

**Braithwaite F<sup>1</sup>**, Walters J<sup>1</sup>, Williams M<sup>1</sup>, McEvoy M<sup>1</sup>

<sup>1</sup>*The Sansom Institute for Health Research, University of South Australia, Adelaide, Australia*

MPA12E, Meeting Room C4.10, October 21, 2017, 2:35 PM - 3:20 PM

### Aim:

To identify factors to improve the believability of shams for physical treatments.

### Design:

Delphi survey.

### Method:

Two groups of experts [research methodology (n = 22); deceptive/hypnotic techniques (n = 16)] were recruited. Round 1 posed an open-ended question. Responses were grouped according to theme with individual items based on verbatim responses. Rounds 2 and 3 involved experts rating perceived importance of items (9-point Likert scale). Items reached consensus if there was  $\geq 80\%$  agreement among experts.

### Results:

Thirty experts completed at least one round. Seventy-nine items were developed and rated, and eight themes were identified by the research team [expectations/beliefs (10 items); information (eight items); therapist attributes/behaviour (three items); treatment response (three items); therapeutic interaction (11 items); standardisation/indistinguishability (nine items); protocol (seven items); specific strategies (28 items)]. Six items reached consensus in both expert groups; an additional 13 items reached consensus in the deceptive/hypnotic techniques expert group, and two in the research methodology expert group. Items related to managing expectations, and the credibility of the sham, treatment context, and therapeutic interactions were considered the most important among experts.

### Conclusion:

Expert opinion suggests that expectations, treatment context, and therapeutic interactions are just as important as the credibility of the sham treatment itself for overall treatment believability.

### Key Practice Points:

- Developing credible shams for physical treatments is a practical challenge
- Future shams for physical treatments should carefully consider patient and therapist expectations, the treatment context, and therapeutic interactions as experts identify these as important contributors to overall treatment believability.

## ILLUSORY SPINAL MOVEMENT IN VIRTUAL REALITY: MIRROR THERAPY FOR THE SPINE?

**Harvie D<sup>1</sup>**

<sup>1</sup>*Recover Injury Research Centre, Griffith University, Gold Coast, Australia*

MPA12E, Meeting Room C4.10, October 21, 2017, 2:35 PM - 3:20 PM

### Aim:

We aimed to test whether perception of spinal motion could be altered using virtual reality, in advance of testing the potential therapeutic benefit of the kinesthetic illusion: the Motor Offset Visual illusion (MoOVi).

### Design:

Within-subjects repeated measures experiment.

### Method:

24 healthy volunteers performed neck movements to 50 degrees of rotation, while a virtual reality system delivered corresponding visual feedback that was offset by a factor of 50% to 200%, thus simulating more or less movement than was actually occurring. At 50 degrees of real-world head rotation, participants pointed in

the direction that they perceived they were facing. The discrepancy between actual and perceived direction was measured and compared between conditions.

**Results:**

Perception of head movement was dependent on visual-kinaesthetic feedback ( $p = 0.001$ , partial eta squared = 0.17). That is, altered visual feedback caused a kinaesthetic drift in the direction of the visually suggested movement. The magnitude of the drift was not moderated by secondary variables such as the addition of illusory auditory feedback, the presence of a virtual body reference, or three-dimensionality of the scene.

**Conclusion:**

Virtual reality can be used to augment perceived movement and body position, such that one can perform a small movement, yet perceive a large one. The MoOVi technique tested here has clear potential for assessment and therapy of people with spinal pain.

**A BRIEF ASSESSMENT TOOL DERIVED FROM THE DIZZINESS HANDICAP INVENTORY TO SCREEN FOR CERVICOGENIC DIZZINESS: A CASE CONTROL STUDY**

**Reid S<sup>1</sup>**, Katekar M<sup>2</sup>, Callister R<sup>2</sup>, Treleaven J<sup>3</sup>

<sup>1</sup>*Australian Catholic University, North Sydney, Australia*, <sup>2</sup>*The University of Newcastle, Callaghan, Australia*,

<sup>3</sup>*The University of Queensland, St Lucia, Australia*

MPA12E, Meeting Room C4.10, October 21, 2017, 2:35 PM - 3:20 PM

**Aim:**

To derive a brief assessment tool from the Dizziness Handicap Inventory to screen for cervicogenic dizziness.

**Design:**

Case control study.

**Methods:**

The Dizziness Handicap Inventory was completed by 86 people with cervicogenic dizziness and 86 people with general dizziness. Three questions Q1 (looking up), Q9 (are you afraid to leave home alone) and Q11 (quick movements of the head) were answered differently by those with cervicogenic dizziness to those with general dizziness so were compiled into a brief assessment tool. Using the data from 80 participants (40 from each group) a receiver operating characteristic curve was generated to establish a cut-off score for the brief assessment tool. Subsequently, the diagnostic ability of the brief assessment tool was validated using the data from the remaining 92 participants.

**Results:**

The receiver operating characteristic curve indicated an optimal threshold of 9 out of a maximum possible score of 12, where 4 points were given for a 'yes' answer to Q1 and Q11, and 'no' for Q9. The diagnostic ability of the brief assessment tool among the remaining 46 participants from each group was: sensitivity 77% (95% CI: 67 to 84), specificity 66% (56 to 75), positive likelihood ratio 2.28 (1.66 to 3.13), and negative likelihood ratio 0.35 (0.23 to 0.53).

**Key Practice Points:**

- A brief assessment tool of three questions has been developed which could assist clinicians in diagnosing cervicogenic dizziness.
- If people with cervicogenic dizziness can be easily identified, they can be referred for evidenced based physiotherapy management.

## UNDERSTANDING INFORMATION NEEDS OF PEOPLE CONSIDERING ARTHROSCOPY FOR KNEE OSTEOARTHRITIS: INFORMING THE DEVELOPMENT OF AN EVIDENCE-BASED DECISION TOOL

**Slade S**<sup>1,2</sup>, Hoffman T<sup>3</sup>, Buchbinder R<sup>2</sup>

<sup>1</sup>La Trobe University, Centre for Sport and Exercise Medicine Research, Melbourne, Australia, <sup>2</sup>Monash Department of Clinical Epidemiology, Cabrini Institute, Melbourne, Australia, <sup>3</sup>Bond University, Centre for Research in Evidence-Based Practice, Gold Coast, Australia

MPA12E, Meeting Room C4.10, October 21, 2017, 2:35 PM - 3:20 PM

### Background:

Clinical practice guidelines advise that arthroscopy has no role in managing uncomplicated knee osteoarthritis. Consumer information is currently inadequate to guide informed decision-making.

### Aim:

To explore consumer and clinician beliefs about knee arthroscopy for people with osteoarthritis and develop a knee arthroscopy decision support tool.

### Design:

Qualitative study

### Materials and methods:

We recruited consumers with knee osteoarthritis, general practitioners, rheumatologists, orthopaedic surgeons and physiotherapists. Focus groups with GPs and one-to-one interviews with all other participants were audio recorded and transcribed verbatim. All participants gave informed consent and were encouraged to give opinions freely. Data were independently analysed by two researchers using thematic and content methods.

### Results/Conclusions:

There were 37 participants: 7 consumers, 13 GPs, 6 rheumatologists, 3 orthopaedic surgeons and 8 physiotherapists. Four preliminary consumer-oriented themes were identified: 1) consumers have poor understanding of the nature and course of knee osteoarthritis; 2) consumers want to know treatment options and benefits and harms of arthroscopy; 3) pain is the primary driver for people seeking intervention with arthroscopy; and 4) arthroscopy is perceived as a quick and easy solution.

A decision tool should include: individualised information; early, unambiguous descriptions of knee structure and osteoarthritis; diagrams and images; strengthening exercise and weight loss; benefits and harms of intervention; a maximum of one page; and an action plan proforma.

### Key Practice Points:

There is a need to explain knee osteoarthritis, treatment options and benefits and harms of arthroscopy to consumers and to provide early, accurate and uncomplicated information.

## STAFF EDUCATION LED TO A SHORT-TERM INCREASE IN THE PROVISION OF PATIENT INDEPENDENT PRACTICE PROGRAMS ON AN ABI REHABILITATION UNIT

**Fini N**<sup>1,2</sup>, Schneider E<sup>1,3</sup>, Lannin N<sup>1,3,4</sup>

<sup>1</sup>Alfred Health, Melbourne, Australia, <sup>2</sup>Physiotherapy Department, Melbourne School of Health Sciences, The University of Melbourne, Melbourne, Australia, <sup>3</sup>School of Allied Health, La Trobe University, Bundoora, Australia, <sup>4</sup>John Walsh Centre for Rehabilitation Research, Sydney Medical School (Northern), The University of Sydney, Sydney, Australia

NNG12A, Meeting Room C4.7, October 21, 2017, 2:35 PM - 3:20 PM

### Background and Aim:

Patients participating in neurological rehabilitation are known to be inactive between therapy sessions. A patient independent practice program can increase the amount of task specific practice provided in a rehabilitation program. Little is known about how to improve therapist behaviours around providing independent practice programs. The aim of this study was to determine if staff education is associated with an increase in the number of patient independent practice programs provided.

Design:  
Longitudinal knowledge translation study.

Method:  
Six physiotherapists, six occupational therapists and three speech therapists working in an acquired brain injury rehabilitation unit participated. The intervention comprised of three educational sessions about the importance of independent practice, weekly e-mail reminders, and the provision of resources over a two month period. The primary outcome was the number of patient independent practice programs prescribed at baseline, post-intervention, and three months post-intervention.

Results:  
The number of independent practice programs provided to patients increased from baseline to post-intervention. For physiotherapists, the number of patients prescribed a program almost doubled (25% to 48%), and these changes were maintained three months post intervention. Occupational therapists displayed a continual increase in the number of patients with a prescribed program (16% baseline; 25.8% post-intervention; 46.7% three month follow-up). Speech therapists demonstrated a strong increase initially (10.5% baseline; 46.7% post-intervention) with a decrease at follow-up (33.3%).

Conclusion/Key Practice Points:

- Staff education on the importance of providing independent practice programs for patients in neurological rehabilitation is associated with an increased provision of patient independent practice programs.

#### EVALUATION OF A NOVEL METHOD FOR ASSESSING WHOLE-BODY POSTURAL ALIGNMENT IN WALKING, STANDING AND SITTING.

**Mills S<sup>1,2</sup>**, Thewlis D<sup>3</sup>, McDonnell M<sup>2</sup>, Mackintosh S<sup>2</sup>

<sup>1</sup>SA Brain Injury Rehabilitation Service, Adelaide, Australia, <sup>2</sup>University of South Australia, Adelaide, Australia, <sup>3</sup>University of Adelaide, Adelaide, Australia

NNG12A, Meeting Room C4.7, October 21, 2017, 2:35 PM - 3:20 PM

Design:  
Observational study of adults without mobility impairment.

Method:  
Whole-body postural alignment in 12 participants was recorded using a Vicon MX-F20 system. Data were collected for walking, standing and sitting biomechanics on two separate days. Tests were repeated with participants holding rails, for future comparison with a clinical sample with impaired mobility. The position of each body segment's centre of mass was calculated and projected over the walking (stance foot at mid stance), standing (mid point of the feet), or sitting (pelvis) base of support in the transverse plane. Euclidean distances were generated to describe the relative position of each segment. A metric was calculated from the sum of the Euclidean distances divided by the number of body segments. Metrics were compared between testing sessions for reliability.

Results:  
Reliability of this method was moderate to strong with intraclass correlation coefficients ranging from ICC(3,1) = 0.671 (95% CI -0.143 to 0.95) for seated alignment when holding rails, to ICC(3,1) = 0.949 (95% CI 0.809 to 0.986) for walking right midstance. Standing and walking scores showed greater reliability than sitting. Reliability was lower when participants were holding rails than unsupported.

Conclusion/Key Practice Points:

- Biomechanical research of mobility has typically focused on the legs
- Whole-body analysis is important for clinical practice, particularly for people with complex mobility limitations
- This novel method of measuring whole body alignment showed reliability in healthy adults
- Application of this method to evaluate whole-body postural alignment in people with severe acquired brain injury is underway.

## GROUP CONSTRAINT-INDUCED MOVEMENT THERAPY FOR UPPER LIMB RECOVERY AND FUNCTION IN STROKE SURVIVORS: A FOCUS GROUP DESIGN

Goh S<sup>1</sup>, Bellon M<sup>1</sup>, **Lennon S<sup>1</sup>**

<sup>1</sup>Flinders University, Bedford Park, Australia

NNG12A, Meeting Room C4.7, October 21, 2017, 2:35 PM - 3:20 PM

### Purpose:

This focus group design aimed to investigate the patients' perspective of group CIMT.

### Method:

Three stroke survivors (mean age: 63.7 years; mean time post stroke: 15.3 months) participated in a two hour focus group session at the end of their last group constraint-induced movement therapy class. This focus group was facilitated by an honours student and a senior lecturer who had not been involved in the delivery of the intervention. An independent transcriber transcribed the audio recording verbatim. Preliminary themes were developed independently by two researchers, and a consensus was reached on the final themes.

### Results:

The preliminary results for the three week program demonstrated that CIMT improved arm activity. Participants described a range of positive perceptions of group CIMT, with four main themes emerging: (1) peer support; (2) challenging program; (3) functional improvements which led to (4) increased confidence and hope. Five themes influenced the acceptability of CIMT: (1) positive group dynamics; (2) high intensity and repetition; (3) strong support network; (4) components of group CIMT; and (5) having perseverance traits.

### Conclusion/Key Practice Points:

- Utilising a group format enhanced participants' acceptability of the therapy by motivating, encouraging, and providing peer support.
- Delivering group CIMT may also be a resource efficient way to improve accessibility to CIMT, which is currently not widely implemented in practice.
- Whilst these initial findings are positive, additional research is needed to confirm these preliminary results.

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## DOES DOPAMINE REPLACEMENT MEDICATION INFLUENCE LEARNING OF A BALANCE TASK IN PEOPLE WITH PARKINSON'S DISEASE? A RANDOMISED CONTROLLED TRIAL

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NNG12A, Meeting Room C4.7, October 21, 2017, 2:35 PM - 3:20 PM

### Aim:

To determine whether dopamine replacement medication affects general and sequence specific learning of a stepping task in people with Parkinson's disease.

### Design:

Randomised controlled trial of a choice step reaction training task completed "on" versus "off" levodopa medication.

### Method:

Nineteen people with Parkinson's disease and intact cognition were included. The "on" and "off" medication training groups performed multiple trials of a stepping task over three consecutive days (acquisition period), followed by an initial retention and delayed retention test (two and nine days after training, respectively). Each trial consisted of a sequence of 12 random and 12 repeated step sequences presented in a random order across trials. The primary outcomes were general and sequence specific task performance at initial retention.

Secondary outcomes included carryover in task performance between end of training and retention. Between group differences were analysed using analysis of variance.

**Results:**

There were no between group differences in general ( $p = 0.28$ ) or sequence specific ( $p = 0.06$ ) learning of the postural task. Both groups demonstrated improved performance in the stepping task over the acquisition period ( $p = 0.03$ ). There was no between group difference in performance carryover between end of acquisition to either retention session ( $p = 0.12$  to  $0.52$ ).

**Conclusion/Key Practice Points:**

- Dopamine replacement did not differentially affect general or sequence specific learning of a balance task in people with Parkinson's disease.
- Future studies should investigate the practice dose required to improve balance performance in people with Parkinson's disease.

Trial registration: NCT02593812

**CLASSIFYING OBESITY IN SPINAL CORD INJURY: COMPARING BODY MASS INDEX, DUAL ENERGY X-RAY ABSORPTIOMETRY, AND BIOIMPEDANCE ANALYSIS TO DEUTERIUM DILUTION**

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NNG12A, Meeting Room C4.7, October 21, 2017, 2:35 PM - 3:20 PM

Substantial atrophy occurs rapidly in patients with spinal cord injury and is often accompanied by increasing adiposity over time. Close monitoring of changes in body composition is recommended to avoid overfeeding and unwanted weight gain. Monitoring weight change alone is insufficient, because expected weight loss from muscle atrophy is likely to mask increases in fat mass. Body mass index (BMI), calculated from height and weight, is widely used to classify obesity in able-bodied people. However, the sensitivity of BMI to distinguish obese from non-obese in chronic SCI is very low.

**Aim:**

Assess the clinimetrics of bioimpedance analysis and dual energy x-ray absorptiometry (DXA) to measure fat mass and identify obesity in acute traumatic spinal cord injury, using deuterium dilution as criterion reference.

**Design:**

Observational

**Method:**

Twenty participants 4-8 weeks post-injury completed deuterium and bioimpedance measurements. Thirteen also completed DXA. A clinimetric analysis of these tools was completed. Bland-Altman plots were used to assess agreement between measures.

**Results:**

Specificity for all measures was 83-86%. Percentage FM from DXA was most sensitive (100%). Bioimpedance outperformed BMI (sensitivity 83.3%). BMI >30 had poor sensitivity (25%) and BMI >25 had good sensitivity (58.3%). The agreement between measures is discussed.

**Key Practice Points:**

- Percentage fat mass from DXA is the best indicator of obesity in acute spinal cord injury
- Bioimpedance is a practical and objective bedside measure of FM with very good clinimetrics.
- When using BMI, a cutoff of BMI >25 is recommended to detect obesity in acute spinal cord injury.

## THE TARDIEU SCALE: REVISITING ITS INCEPTION AND APPLICATION FOR TESTING FOCAL SPASTICITY

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NNG12B, Meeting Room C4.9, October 21, 2017, 2:35 PM - 3:20 PM

### Background:

The Tardieu scale has been used in the adult neurological clinical setting for over 15 years. However, clinicians have at times confused and added nomenclature described within the modified Tardieu scale. By describing the evolution of the Tardieu scale from its inception back in the 1950s to now, will provide a greater understanding of its fundamental principles and clarify test positions and subsequent recording of findings when assessing focal spasticity.

### Aims /Objectives:

To improve participant's knowledge when assessing focal spasticity and accurately record their findings so that planning management strategies for intervention is improved producing better outcomes for patients.

### Approach:

The presenters will provide a lecture style background introduction (10 mins) followed by practical demonstration of the test procedures for the both the lower limb and upper limb (10 mins). Participants will then have the opportunity to practice the test procedures (10 mins). Handouts describing test procedures and an example of recording test findings will be supplied.

### Conclusion/Key Practice Points:

- Participants will be able to accurately test for focal spasticity in the lower and upper limb using the Tardieu scale
- Participants will gain an appreciation of benefits and limitations of the test procedure
- Accurate recording of findings will facilitate interpretation of findings which will promote improved planning for interventions.

## TRANSCRANIAL MAGNETIC STIMULATION FOR PHYSIOTHERAPISTS: HOW-TO ASSESS THE INTEGRITY OF THE MOTOR SYSTEM IN STROKE.

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NNG12C, Meeting Room C3.5, October 21, 2017, 2:35 PM - 3:20 PM

### Background:

Transcranial Magnetic Stimulation, or TMS, is a neurophysiological technique that can non-invasively investigate the motor system. It is becoming increasingly important in the prediction of recovery of arm function following stroke, and may be more useful as a biomarker of recovery than imaging modalities. Physiotherapists are well placed to be involved in the assessment of motor system integrity in hospital settings, and this role may expand in the future.

### Aims / objectives:

To improve participants' knowledge regarding how TMS can be used to investigate the integrity of the motor system. This will include a brief background on the tool itself, the neurophysiological basis for the evoked motor responses, and the recording of these using surface electromyography. Participants will have an opportunity to practice the technique, and will understand how to interpret the TMS findings alongside other features of the patient's presentation.

### Approach:

The presenters will provide a lecture style background introduction (10 mins) followed by a practical demonstration of the use of TMS to investigate the integrity of the corticospinal pathway (10 mins).

Participants will then have the opportunity to practise applying TMS to others (after completing safety screening), and interpreting the results (10 minutes).

Conclusion / Key Practice Points:

- Participants will be able to describe, in lay language, how TMS can be used as a tool to understand the motor system in a number of clinical conditions, with a focus on stroke
- Participants will develop basic skills for the safe application of TMS.

## SELF-MANAGEMENT AND THE STROKE SURVIVOR: TRANSLATING EVIDENCE INTO PRACTICE

**Preston E<sup>1</sup>**, Mahendran N<sup>1</sup>

<sup>1</sup>*University of Canberra, Bruce, Australia*

NNG12D, Meeting Room C4.1, October 21, 2017, 2:35 PM - 3:20 PM

Background:

Self-management interventions require the stroke survivor, family/carers, and health care provider to work together to increase the patient's self-efficacy and his or her capacity to manage the sequelae of stroke. Our work, and that of others, suggests that self-management interventions are feasible, and effective for stroke survivors. Self-management interventions with demonstrated efficacy consistently include information provision, goal setting, and problem solving. As such, physiotherapists are well-placed to implement self-management interventions. Despite this, the national stroke audit (2015) indicates that self-management interventions are only offered to 41% of appropriate stroke survivors, and only after discharge from rehabilitation.

Aims / objectives:

For participants to:

1. Demonstrate an understanding of the important elements of self-management interventions
2. Identify people after stroke who can engage in self-management
3. Demonstrate competence in implementing the important elements of self-management interventions.

Approach:

The presenters will provide a lecture style background introduction (10 mins) followed by a video demonstration of the important elements of self-management (5 mins). Participants will then have the opportunity to practise these important elements (10 minutes) and receive feedback from peers (5 minutes). Learning materials provided will include a guideline and checklist on important elements for self-management interventions.

Conclusion / Key Practice Points:

Participants will:

- Understand the important elements of self-management interventions
- Be able to identify people after stroke who can engage in self-management interventions
- Be able to effectively implement important elements of self-management interventions into stroke rehabilitation.

## LIVING WITH SEVERE MUSCLE WEAKNESS: PERSPECTIVES OF YOUTH WITH NEUROMUSCULAR DISORDERS

**Travlos V<sup>1</sup>**, Downs J<sup>2,3</sup>, Wilson A<sup>1</sup>, Bulsara C<sup>1</sup>, Hince D<sup>4</sup>, Patman S<sup>1</sup>

<sup>1</sup>*University of Notre Dame Australia, Fremantle, Australia*, <sup>2</sup>*Telethon Kids Institute, Subiaco, Australia*,

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NPG12, Meeting Room C4.11, October 21, 2017, 2:35 PM - 3:20 PM

Background:

Youth with Neuromuscular Disorders (NMD) who are wheelchair users can now survive well into adulthood if their multisystem comorbidities are prudently managed. Uptake and adherence to health behaviors is particularly challenging during adolescence.

**Aim:**

The MyLifeMyVoice Teen NMD study set out to describe and explore relationships between youths' wellbeing, health, participation and healthcare engagement. The conceptual model was the International Classification of Functioning, Disability and Health (ICF).

**Design:**

A two-phased mixed methods design including a cross-sectional survey and qualitative study.

**Method:**

Youth aged 13 – 21 years old were recruited from across Australia and New Zealand. Thirty-eight (mean age 17.4 years; 82% male; 63% DMD) completed a comprehensive, self-report questionnaire. The primary outcome measure was the Warwick Edinburgh Mental Wellbeing Scale (WEMWBS). Relationships between wellbeing and variables within and across each ICF domain were explored using regression models. Eleven youth were purposefully selected to semi-structured interviews exploring their perceptions of healthcare engagement.

**Results:**

WEMWBS scores were high (mean 55.4/70, SD 8.1). Over half of youth lived with severe comorbidities. Multivariate modelling revealed that wellbeing was associated with frequency of health concerns, educational attainment and social support, but not with participation frequency. Youth described co-constructed healthcare engagement and the impact of their compromised health on participation.

**Conclusion/Key Practice Points:**

- Attending to the body systems comorbidities that may most impact pain and fatigue as well as to facilitating education, family and friends' support, likely optimises youth's wellbeing.
- Youths' experiences highlight specific concerns that inform the physiotherapist's role in supporting youths' healthcare engagement and wellbeing.

## E-Posters

### A PILOT EVALUATION OF AN E-LEARNING TOOL FOR OBJECTIVE STRUCTURED CLINICAL EXAMINATION FEEDBACK.

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<sup>1</sup>Department Of Physiotherapy, School Of Health Sciences, The University of Melbourne., Parkville, Australia,

<sup>2</sup>Department of Nursing, School of Health Sciences, The University of Melbourne., Parkville, Australia

#### Aim:

To evaluate the student experience of the e-learning clinical examination feedback tool, Musculoskeletal Objective Structured Clinical Examination Rapid Feedback, through a pilot study of first year physiotherapy students.

#### Design:

As the e-learning feedback tool was purpose-built and untried, the research used a design-based pilot study consistent with early e-learning lifecycle literature. This design uses structured testing-redesign-retesting to progress e-learning tools.

#### Method:

Qualitative data was collected via online survey, from a convenience sample of second-semester first-year physiotherapy students, following their musculoskeletal examination, to determine their experience of the e-learning feedback tool.

#### Results:

100 first-year students were assessed using the e-learning feedback tool and 16 students responded. A range of students (67-92%) identified that this feedback would direct their studies to improve musculoskeletal: knowledge; manual skills; patient assessment; patient treatment and exercise delivery; and patient education. Students reported appreciation of the detail, form and time contributed by staff via written feedback.

No formal statistical analysis was performed due to inadequate power.

#### Conclusion/Key Practice Points:

- Pilot data supports the use of the e-learning feedback tool with this cohort and recommendations have been made to modify the software program to refine and enhance the specific feedback.
- An expanded trial at the end of the year will be undertaken to enable more definitive analysis.
- An interdisciplinary collaboration with other Health Science disciplines is also being undertaken and, if successful, has the potential for elaboration to other subjects and courses with benefit to physiotherapy and health science disciplines.

Ethics Approval: HEAG1545338

### A PROTOCOL FOR AN INNOVATIVE GENERAL PRACTITIONER AND PHYSIOTHERAPIST MODEL OF CARE FOR COPD

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University of Sydney, Camperdown, Australia, <sup>5</sup>School of Medicine, University of Wollongong,, Wollongong, Australia

#### Aim:

To evaluate a novel physiotherapy outreach service within primary care for the effective identification and management of people with COPD.

#### Design:

Pre and post feasibility study recruiting four general practices

#### Method:

General practices will be eligible if they use computerised clinical software and have a room available for use by the physiotherapist. Two groups of patients will be recruited: adults aged 40+ years with a recorded diagnosis of COPD and adults aged 40+ years at risk of COPD. Eligible participants will attend the practice to complete an initial self-report questionnaire, pre and post bronchodilator spirometry, and the Active Australia questionnaire. Review of inhaler technique, action plan education, physical activity counselling and referral to pulmonary rehabilitation will be provided as necessary by the physiotherapist. A GP management plan will be developed in partnership with the GP. Participants will be re-assessed after three and six months.

#### Results:

Both process outcomes and patient outcomes will be reported. Process outcomes will include percentage of people who: are invited and attend the clinic; complete a spirometry test, have a confirmed diagnosis of COPD; and are referred to a pulmonary rehabilitation program. Patient outcomes will examine change in: physical activity score and smoking status. Interviews of GPs and physiotherapists to determine acceptability of the partnership approach will be conducted at the end of the study.

#### Conclusion/Key Practice Points:

- If effective, this innovative model of GP – physiotherapist partnership could lead to improvements in the quality of care and health outcomes for people with COPD.

#### A STRUCTURED APPROACH FOR DEVELOPMENTAL PHYSIOTHERAPY INTERVENTION FOR INFANTS IN THE ACUTE, TERTIARY SETTING TO ENSURE CONSISTENT AND TARGETED MANAGEMENT.

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<sup>1</sup>Children's Health Queensland, South Brisbane, Australia

#### Aims:

To develop a clinical pathway for physiotherapists working in the acute setting to provide appropriate developmental support for infants in the context of the critical care environment.

#### Design:

A 2016 Australian survey of Paediatric Intensive Care Unit (PICU) physiotherapists and a 12 month review of infants admitted to Lady Cilento Children's Hospital (LCCH) PICU to define groups depending on acuity, complexity and length of stay.

Method: Common themes and discrepancies regarding how and when developmental needs of infants are managed were identified from the survey. Based on the review findings a clinical pathway was devised to standardise intervention plans delivered by the PICU therapist. Infants admitted for greater than 1 month had a shared-care model with PICU and neuroscience teams. Consistent non-standardised assessment was agreed upon as well as standardised early infant assessments.

#### Result:

The survey reported that the developmental needs of infants are often de-prioritised. However last year 37.2% of children admitted to Queensland PICU's were under 12 months. In 2016 the LCCH critical care team provided 500 hours of developmental intervention for 156 infants, demonstrating low levels of potential therapeutic interventions. Need for a clinical pathway to ensure targeted assessment and intervention of three groups was identified and piloted. Early data and parental feedback is positive.

#### Key Practice Points:

- Early recognition of infants in critical care requiring developmental input should be prioritised to ensure timely and appropriate assessment and intervention
- Developmental clinical pathway may delineate roles and use of shared care models and provide clarity on assessment tools and targeted interventions.

## A STUDY PROTOCOL FOR DEVELOPING QUALITY INDICATORS TO MEASURE THE CARE OF PATIENTS WITH MUSCULOSKELETAL INJURIES IN THE EMERGENCY DEPARTMENT

**Strudwick K<sup>1,2</sup>**, Bell A<sup>3,4</sup>, Russell T<sup>2</sup>, Martin-Khan M<sup>5,6</sup>

<sup>1</sup>Physiotherapy and Emergency Departments, QEII Jubilee Hospital, Metro South Hospital and Health Service, Coopers Plains, Australia, <sup>2</sup>School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, Australia, <sup>3</sup>Department of Emergency Medicine, The Royal Brisbane and Women's Hospital, Metro North Hospital and Health Service, Herston, Australia, <sup>4</sup>School of Medicine, The University of Queensland, Brisbane, Australia, <sup>5</sup>Centre for Research in Geriatric Medicine, The University of Queensland, Brisbane, Australia, <sup>6</sup>Centre for Online Health, The University of Queensland, Brisbane, Australia

### Aim:

To develop a suite of evidence-based quality indicators (QI) which will provide a measure of the quality of care provided to patients with musculoskeletal injuries in the Emergency Department (ED).

### Design:

A multi-phase mixed methods study design.

### Method:

The study protocol consists of four phases. Phase 1 will involve the performance of a systematic review to identify and critically appraise existing QIs for musculoskeletal injuries in the ED. Phase 2 will then build on the gaps identified in the review by developing a suite of preliminary QIs based on current evidence, under the governance of an expert panel. The preliminary QI suite will undergo field-testing for feasibility and validity in Phase 3, across eight EDs in Queensland (n = 640 patients). Phase 4 will involve refining the suite in consultation with the expert panel and finalised using a formal voting process.

### Results:

The QIs developed through this study will be evidence-based and balanced across the areas of structures, processes and outcomes. The rigorous methodology used to develop and test the QIs will result in QIs that are meaningful, valid, feasible to collect, efficiently measurable, amenable to improvement, and selected by experts in the emergency medicine field.

### Conclusion / Key Practice Points:

- The assessment of performance against QIs provides a quantitative measure for the quality of care provided to patients, to identify and target quality improvement activities.
- The final QI suite will have applications across EDs that affords comparison, benchmarking and optimisation of emergency care for patients.

## A VESTIBULAR BUDDY PROGRAMME IS EFFECTIVE FOR IMPROVING KNOWLEDGE AND CONFIDENCE IN HOSPITAL BASED PHYSIOTHERAPISTS

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<sup>1</sup>Physiotherapy Department, Sir Charles Gairdner Hospital, Nedlands, Australia

### Aim:

To assess the effectiveness of a Vestibular Buddy Programme in developing physiotherapists' knowledge of assessment and treatment of the dizzy patient in a tertiary hospital setting. Secondly, to assess the behavioural effects of the programme on participants when managing these patients.

### Design:

Prospective cohort study

### Method:

Interested Physiotherapists were allocated a mentor, a senior physiotherapist experienced in Vestibular rehabilitation. Each mentor was allocated a group of 4 – 8 physiotherapists. The programme consisted of a combination of participant and mentor led tutorials and the 'buddy' component, where the mentor could be called upon to co-assess and treat appropriate patients. The participants completed a purpose developed knowledge and behaviours questionnaire, based on Kirkpatrick's Levels of Training Evaluation, prior to commencing the programme and at the end of the programme.

#### Results:

27 physiotherapists participated in 2 programmes between September 2014 and March 2017. Seventeen participants completed both pre and post questionnaires. Knowledge scores and confidence and competence ratings improved significantly from pre to post assessment ( $p < 0.008$ ).

#### Key Practice Points:

- This small study demonstrates that a low cost and convenient buddy programme delivers significant outcomes, and may be considered a feasible method of delivering targeted Vestibular Rehabilitation education to hospital based physiotherapists, potentially improving patient care in this population.

### ACTIVITY LEVELS IN HOSPITALISED ELDERLY: WHERE DO WE FIND THE MOMENTUM?

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#### Aim:

To assess and compare the activity levels of elderly patients admitted onto an acute medical ward or geriatric evaluation and management unit (GEMU) in an Australian tertiary hospital.

#### Design:

Prospective open observational study

#### Method:

32 consenting patients over 65 years admitted onto an acute medical (n = 16) or geriatric evaluation unit (n = 16) in a tertiary hospital were included in the study. Activity levels and people present were recorded every 10 minutes for 2 consecutive days from 8am – 5pm

#### Results:

Patients admitted to the GEMU demonstrated higher levels of activity compared with patients managed in an acute medical unit, spending 26% of their day in bed compared to 51% in acute medicine, 5% of their day in walking activities compared to 1% and 21% of their day in ADL's compared with 14%. Patients managed in GEMU were nearly 5 times more likely to participate in therapy and over 3 times more likely to be walking ( $p < 0.0001$ ).

#### Conclusions/Key Practice Points:

- This study demonstrates that higher levels of patient activity are achieved in a geriatric evaluation setting, and key elements of this setting need to be understood to enable translation into other environments providing acute care for elderly patients.

### AN AUDIT OF THE IMPACT OF DAY OF MOBILISATION FOLLOWING LOWER LIMB JOINT REPLACEMENT SURGERY ON DISCHARGE OUTCOMES AND STATUS

**Fels M<sup>1</sup>**, Fitzgerald J<sup>1</sup>, Harm K<sup>1</sup>

<sup>1</sup>Active Rehabilitation, South Brisbane, Australia

Day zero mobilisation for a number of lower limb orthopaedic prosthetic surgeries was partially introduced in a busy, private orthopaedics ward. This audit evaluates factors that may be expected to change as a result.

Patient functional mobility post operatively is a major factor in length of stay or discharge destination in the hospital setting. An audit on very early mobilisation practice would provide information to inform practice.

During normal inpatient hospital care, type and day of operation, day of mobilisation, discharge date and destination, as well as patient expectations to transfer to rehabilitation were recorded by physiotherapists on the orthopaedic ward. Data collected were later de-identified and analysed to evaluate the impact of early mobilisation on length of hospital stay, mobility status and discharge destination.

Audit results from 100 records showed very early mobilisation had no impact on discharge destination (40% discharged home for all groups). For those patients discharged home, a small reduction in length of stay was

noted - average 3.9 days (Day Zero mobilisation) compared with 5.3 days (Day One mobilisation). A significant factor in discharge destination was patient expectation - 95% of patients expecting to attend inpatient rehabilitation, did so, and 83% expecting to go home, did.

In an increasingly resource constrained environment, all factors positively impacting on length of stay, discharge destination and functional mobility in the acute clinical setting should be considered. Based on findings in this audit, day of mobilisation post prosthetic surgery and patient discharge destination expectations could be taken into consideration.

#### ASSOCIATION OF LEVELS AND TYPES OF PHYSICAL ACTIVITY WITH CHRONIC BACK CONDITIONS: A POPULATION-BASED POOLED ANALYSIS OF ADULTS IN BRITAIN

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<sup>1</sup>The University of Sydney, Sydney, Australia

##### Aim:

To investigate the association between levels of total and specific-type physical activity participation and chronic back conditions.

##### Design:

The study included data from the Health Survey for England (1994-2008) and Scottish Health Survey (1995-2003), which are nationally representative surveys of the general population residing in households in England and Scotland.

##### Method:

The analyses included 83736 adults aged  $\geq 16$  years. Multiple logistic regression examined the association between intensity adjusted total physical activity volume (MET-hours/week); weekly volume (minutes/week) in activity of vigorous and moderate intensity; and intensity adjusted volume (MET-hours/week) in walking, domestic, recreational sports, and cycling.

##### Results:

People who were sufficiently ( $\geq 7.5$  and  $< 15$  MET-hours/week) and very active ( $\geq 15$  MET-hours/week) were less likely to report chronic back condition (OR 0.62; 95% CI 0.56 to 0.69, and OR 0.60; 95% CI 0.55 to 0.65, respectively) compared to those who are inactive. People engaged in  $\geq 300$  minutes/week of moderate and  $\geq 75$  minutes/week of vigorous intensity physical activity were less likely to report chronic back condition (OR 0.76; 95% CI 0.64 to 0.89, and OR 0.78; 95% CI 0.71 to 0.87, respectively) compared to those who did not engage in any moderate and vigorous physical activity.

##### Conclusion/ Key Practice Points:

- The results found a significant association between the levels and specific-types of physical activity and prevalence of chronic back conditions.
- In general, adhering to the current physical activity guidelines was associated with approximately 40% lower odds of reporting chronic back conditions compared to those who are inactive.

#### ATTITUDES, BARRIERS AND ENABLERS TO PHYSICAL ACTIVITY IN PREGNANT WOMEN: A SYSTEMATIC REVIEW

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##### Aim:

To identify the attitudes, barriers and enablers to physical activity perceived by pregnant women including the at risk group of women with gestational diabetes mellitus.

##### Design:

A systematic review of studies using qualitative or quantitative methods was completed.

#### Method:

Eight databases (AMED, CINAHL, Embase, Joanna Briggs Institute, Medline, PsycInfo, PubMed and SPORTDiscus) were searched to identify studies that met the inclusion criteria. Studies were included if participants were pregnant without complications and explored women's attitudes, barriers and enablers to physical activity during pregnancy. Quantitative data were analysed descriptively. Qualitative data were analysed thematically using an inductive approach and content analysis applied. Findings were organised within a social-ecological framework.

#### Results:

Forty-nine papers (7655 participants) were included. Pregnant women had a positive attitude towards physical activity, identifying it as important and beneficial. Barriers to physical activity were fatigue, lack of time and pregnancy discomforts and varied according to stages of pregnancy. Enablers included maternal and foetal health benefits, social support and pregnancy-specific programs. Few environmental factors were identified. Little information was available about physical activity attitudes, barriers and enablers in women with gestational diabetes mellitus.

#### Conclusion/Key Practice Points:

- Intrapersonal themes including maternal health and well-being, pregnancy symptoms, time and safety, were frequently cited as barriers and enablers to physical activity during pregnancy.
- Social support, particularly partner and family support appeared to play an important influencing role.
- Person-centred strategies that respond to intrapersonal and social factors are needed to translate pregnant women's positive attitudes into increased physical activity participation.

### BALANCE EVALUATION SYSTEMS TEST (BESTest) AND THE MINI-BESTest: REPRODUCIBILITY IN SCHOOL-AGED CHILDREN

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#### Aim:

To evaluate the reproducibility of the Full Balance Evaluation Systems Test (Full-BESTest) and Mini-BESTest in children.

#### Design:

Intra-rater, inter-rater and test-retest reproducibility

#### Method:

Thirty-four children, 7-17 years, participated in intra-rater and inter-rater evaluation, and 22 children returned for repeat assessment six weeks later for evaluation of test-retest reliability. Postural control was assessed using the Full-BESTest and the short-form Mini-BESTest. Intra-rater, inter-rater and test-retest reproducibility were examined using video assessment. Test-retest reproducibility was also assessed in real-time. Reproducibility was examined by agreement and reliability statistics. Agreement was calculated using percentage of agreement, Limits of Agreement and Smallest Detectable Change. Reliability was calculated using Intra-class Correlation Coefficients.

#### Results:

Results showed that the reliability of Total Scores was excellent for the Full-BESTest for all conditions (all ICCs > 0.82), whereas the Mini-BESTest ranged from fair to excellent (ICC = 0.56 to 0.86). Percentage of Domain Scores with good-excellent reliability (ICCs > 0.60) was slightly higher for the Full-BESTest (66%) compared to the Mini-BESTest (59%). Smallest Detectable Change scores were good to excellent for the Full-BESTest (2% to 6%) and for the Mini-BESTest (5% to 10%) relative to total test scores.

#### Conclusion:

The Full-BESTest and Mini-BESTest can discriminate postural control abilities within and between days in school-aged children. The Full-BESTest has slightly better reproducibility and a broader range of items, making it the most useful version for treatment planning. Minor modifications are recommended to improve

reproducibility for children (titled Kids-BESTest). Future psychometric research is recommended for specific paediatric clinical populations.

## BEAT-HABILITATION: THE EFFICACY OF ACTIVE MUSIC THERAPY FOR PEOPLE WITH PARKINSON'S DISEASE - A SYSTEMATIC REVIEW AND META-ANALYSIS.

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### Aim:

To assess the efficacy of Active Music Therapy for people with Parkinson's disease using the WHO-ICF framework, underpinning person-centered approach and incorporating all factors within the analysis. To date no review has assessed and synthesized all different forms of active music therapy.

### Design:

Systematic review with meta-analyses of randomized trials

### Methods:

Two reviewers searched seven electronic databases: CINAHL, EMBASE, Medline, PEDro, AMED, psycINFO and the Cochrane library from inception to August 2016. Reviewers independently assessed the methodological quality of studies with Physiotherapy Evidence Database scale & the Cochrane risk of bias tool. RevMan 5.3 was employed to perform meta-analyses. Subgroup analysis regarding type and dosage of intervention was conducted to explore sources of heterogeneity.

### Results:

1,324 participants from twenty-three randomized controlled trials, two randomized cross-over trials and one quasi-randomized controlled trial (ten dance, two active music therapy, eight neurologic music therapy, six adjuncts to physical therapy) were included. Most studies had moderately strong methodological quality.

### Conclusions/Key Practice Points:

- Acceptance of complementary therapies has grown in recent years since science has backed its fundamental neural responses, with promising results filling the gap left by conventional therapy. Active music therapy has immediate multidimensional moderate-large beneficial effects on both motor & non-motor symptoms in people with PD; with minimal adverse events and high adherence rates, making it a safe, enjoyable & feasible treatment option.
- Further research is needed to verify the most appropriate volume, intensity and type of therapy.
- Higher-quality studies are required to determine the long-term effects of active music therapy.

## BRIDGING GAP BETWEEN CLASSROOM LEARNING AND CLINICAL PRACTICE USING HIGH-FIDELITY SIMULATION-BASED FLIPPED CLASSROOM

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### Aim:

To evaluate the effectiveness of high-fidelity simulation-based flipped classroom on enhancing students' learning experience.

### Design:

Mixed methods research using quantitative and qualitative data

### Method:

One hundred physiotherapy students attended high-fidelity simulation-based flipped classroom. Students were divided into small groups with pre-assigned roles: peer-observers, student-therapists for assessment and treatment. All students went through 2 pre-class and 3 in-class activities. They were required to 1) identify case-related assessment and management strategy; 2) complete pre-class online assignment with case-specific questions; 3) perform in-class simulation practice; 4) involve in facilitated debriefing about their performance and 5) complete in-class online tasks with self- and peer-performance evaluation and case-specific questions for reinforcing and consolidating knowledge gained. Pre- and post-module questionnaires

(5-point Likert scale) were used to evaluate self-perceived competency and self-confidence with data analysed by paired t-test. In addition, students were invited for focus-group interviews regarding their learning experience with data transcribed and analysed using thematic analysis.

**Results:**

Seventy-nine students returned questionnaires. Post-module levels of self-perceived confidence and competency in performing assessment and treatment were increased by  $0.4 \pm 0.9$  and  $0.6 \pm 0.9$  points ( $p < 0.001$ ) respectively. All students agreed that the modules improved their clinical reasoning and prepared them for clinical placement. Regarding students' learning experience, focus-group interviews revealed that this innovative pedagogy enhanced their personal learning and reflection, helped integrating knowledge within short period of time, bridged the gap between university learning and clinical-setting and enhanced peer-learning.

**Conclusion:**

Incorporating high-fidelity simulation into flipped classroom is feasible to bridge learning gap between classroom learning and clinical practice optimizing students' learning experience and integration of knowledge.

### CAN PHYSIOTHERAPISTS REDUCE NEUROSURGICAL WAIT LISTS FOR PATIENTS REFERRED WITH LOW BACK PAIN?

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<sup>1</sup>Hunter New England Local Health District, New Lambton Heights, Australia

**Aim:**

Identify service improvements from piloting a Physiotherapy triage clinic embedded in a tertiary referral hospital Neurosurgical clinic

**Design:**

Prospective observational study of five week pilot Physiotherapy Neurosurgical triage clinic for back pain referrals

**Method:**

Prospective data collection of patients seen in Physiotherapy triage clinic on appointment outcome, diagnosis, imaging referrals, examination findings and clinic discharge rates.

**Results:**

41 patients were managed in the pilot clinic, with 12.5% reporting dominant leg pain, 50% back pain and 28% indeterminate source. Patients had an average wait time of 2 years. The clinic were staffed a senior Physiotherapist with over 8 years' experience. 16 patients were diagnosed with nonspecific low back pain, 21 with radicular leg pain or canal stenosis, 1 with peripheral neuropathy and 3 other diagnoses. 50% of patients indicated they preferred non-surgical management for their symptoms. 21 patients were discharged to their GP, 1 patient required surgery, 19 required MRI's with Neurosurgical follow up. Of the 19 patients requiring MRI's 4 were subsequently discharged, 5 received steroid injections, 1 required surgery and 9 are still awaiting follow up. 100% agreement between Neurosurgeon and Physiotherapists occurred for diagnosis and management plans.

**Conclusion/ Key Practice Points:**

- Physiotherapists can effectively Neurosurgeons in developing management plans for back pain in an outpatient clinic.
- Half of patients referred to a Neurosurgeon do not want or require surgery, supporting a role for Physiotherapists to advise conservative management plans in Neurosurgical clinics.
- Further study is required on a larger population to confirm results

## CASE STUDY OF HOW CRANIOSACRAL TECHNIQUES RELEASED SPASM AROUND FERRET'S COSTOTRANSVERSE JOINT SPRAIN

### Lamming M

#### Subjective:

Maisie, young adult ferret, surrendered to Forever Ferrets Rescue, with a hard 1cm lump at left thoracic spine, resting more often than normal. Veterinarians suspect dwarfism. Suggested physiotherapist assessment of the lump before investigating with x-rays (requiring anaesthetic). Other medical issues: upper respiratory tract infection not clearing despite antibiotics, malnourished.

#### Objective:

Hard lump below left scapula, close to spine at costotransverse joints 3- 5 (ferrets usually have a very flexible, 'collapsible' ribcage). Significant fascia and dura restrictions left upper/mid thoracic spine and right pelvis/sacroiliac joint. Palpable scoliosis. Gait symmetrical but slow

#### Hypotheses:

Facet joint stiffness, costovertebral joint strain, secondary soft tissue spasm, skeletal asymmetries from dwarfism with associated joint and soft tissue dysfunction, something insidious requiring veterinarian investigation

#### Treatment options:

Mobilisations, massage, stretches, craniosacral, strain counterstrain.

#### Working hypothesis:

Costovertebral joint sprain with secondary spasm due to dwarfism/skeletal asymmetries affecting ribcage and respiratory function.

#### Treatments:

Ferrets have flexible spines, the costovertebral joints are smaller than a finger tip. I wanted to avoid techniques that may cause pain. I chose the most gentle- craniosacral to the fascia and dura. Maisie had three weekly treatments. At the last appointment the lump was gone and the foster carers noticed less resting, more mobilising and the respiratory infection as resolved.

#### Key Practice Points:

- When the anatomy is so small, techniques like craniosacral can be helpful
- Indirect techniques like craniosacral that do not push into or stretch painful structures can be useful when you want to avoid a reaction/ bite

## CHANGE IN PAIN KNOWLEDGE OCCURRING AFTER A NEUROSCIENCE EDUCATION SEMINAR FOR WOMEN WITH CHRONIC PELVIC PAIN

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#### Aims:

a) To assess the change in pain knowledge in women with CPP after a NE seminar and b) to explore whether perceptions about the reasons for the onset and persistence of CPP changed following the NE seminar.

#### Design & Methods:

Consenting women, diagnosed with CPP, were recruited to attend the 90 minute NE seminar. Knowledge transfer was assessed by administering the NPQ before and after the seminar. In addition, three pre/post seminar open-ended questions were administered in order to explore the participants' understanding of their pain onset and pain persistence. The responses were assessed using the SOLO taxonomy (Biggs & Collis 1982). The pre/post NPQ scores were compared using a paired t-test. The ordinal pre/post scores generated using the SOLO taxonomy were compared using the Wilcoxon signed rank test. Data were analysed using SPSS v 22 and a p-value <0.05 was considered significant.

**Results:**

Data was received from 21/25 participants. Scores for the NPQ increased from a mean (SD) of 61.3 (15.3) % before the NE session to 80.0 (11.0) % after the seminar ( $p < 0.001$ ). SOLO scores increased in 38% of participants, demonstrating an improvement in the depth of knowledge ( $p = 0.02$ ).

**Conclusions:**

NE seminar for women with CPP can improve women's understanding about complex pain concepts and enhance their understanding of their own pain, in line with results from studies in patients with other chronic pain conditions. Further research should investigate whether this improved understanding translates into improved treatment outcomes for women with CPP.

**CHARACTERISTICS OF GENERAL MEDICAL PATIENTS REFERRED TO PHYSIOTHERAPY AT THE ROYAL MELBOURNE HOSPITAL (RMH)**

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**Aim:**

To describe the case mix of medical patients referred to Physiotherapy at the Royal Melbourne Hospital. This forms part of a broader project investigating the association between patient factors and discharge outcomes.

**Design:**

Prospective, single site observational study

**Method:**

Data collected included demographics, co-morbidity (Charlson Co-morbidity Index, CCI), pre-morbid function (Blaylock Risk Assessment Screening Score, BRASS), function (De Morton Mobility Index, DEMMI and Alpha Functional Independence Measure, AlphaFIM) and cognition (Rowland Universal Dementia Assessment Scale, RUDAS), measured within 72 hours of Physiotherapy assessment. Data are presented as median [IQR] or percentage (frequency).

**Results:**

Between July 2016 and February 2017, 250 patients were recruited. Fifty-five percent were female ( $n = 137$ ); aged 82 years [76 to 87] and 44% ( $n = 110$ ) required interpreters. Common diagnoses included diseases of the following systems: Musculoskeletal ( $n = 51$ ), Respiratory ( $n = 46$ ), Circulatory ( $n = 42$ ) and Nervous ( $n = 32$ ). CCI was 2 [1 to 3]. BRASS was 13 [10 to 16]. DEMMI was 34.5 [24 to 37] while AlphaFIM was 30 [24 to 37]. RUDAS was 23 [19 to 26]. Acute stay was 8 days [5 to 14]. On discharge, 54% ( $n = 137$ ) returned home, 37% ( $n = 93$ ) required subacute admissions and 4.4% ( $n = 12$ ) died. Twelve percent ( $n = 31$ ) of patients were readmitted within 28 days.

**Conclusion/Key Practice Points:**

- General medical patients referred to Physiotherapy are a diverse cohort.
- Further research is needed to determine the association between demographics, function and discharge destination.

**CHRONIC ANKLE INSTABILITY IS ASSOCIATED WITH DEFICITS IN BALANCE AND STRENGTH AT THE HIP AND KNEE**

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**Aim:**

The primary aim was to assess hip and knee muscle strength in individuals with chronic ankle instability, a history of one ankle sprain with no ongoing problems (copers), and controls. A secondary aim was to investigate the relationship between proximal strength and dynamic balance.

**Design:**

Cross-sectional study.

#### Method:

Isometric hip and knee strength was measured using a securely fixated hand-held dynamometer in 22 individuals with chronic ankle instability, 15 copers and 22 controls, matched for age, sex, physical activity level, and leg dominance. Balance was assessed using the modified Star Excursion Balance Test. Effect size and Pearson's Correlation Coefficient are reported herein as point estimates of effect.

#### Results:

There were large effect sizes ( $>1.2$ ) for strength deficits of all hip and knee muscles in chronic ankle instability participants compared to controls, with the exception of the hip internal and external rotators. Flexors and extensors of the hip and knee exhibited moderate strength deficits (effect size  $\sim 1$ ) in participants with chronic ankle instability compared to copers. Balance was impaired in chronic ankle instability participants compared to healthy controls and copers. There was a strong positive correlation between abductor strength and posterior-lateral balance ( $r = 0.51$ ), and moderate positive correlations between proximal strength and anterior and posteromedial balance ( $0.32 < r < 0.47$ ).

#### Conclusion:

- Proximal lower limb muscles are weaker in individuals with chronic ankle instability.
- Proximal muscle weakness associated with impaired balance.
- Proximal lower limb strengthening could be considered in the management of chronic ankle instability.

### CONVERTING INSPIRATION INTO INNOVATION; HOW A PHYSIO BUILT AN EXERGAME AROUND BRAIN GAMES AND FALLS PREVENTION PRINCIPLES

#### **Lowry M**

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#### Background:

Despite convincing evidence that exergaming effectively reduces falls and enhances cognitive processing speed, the wii-habilitation era was short lived. Several access barriers have made it difficult for geriatric and neuro rehab physios to prescribe exergaming for independent home practice. At the 2015 APA conference Keynote Speaker Todd Sampson inspired one physiotherapist in the audience to develop a means to train an effective stepping strategy and simultaneously motivate older adults to push the envelope of neuroplasticity.

#### Objective:

To present the journey of a community rehab physio who involved her patients in the design, development and testing of a fit-for-purpose exergaming solution.

#### Approach:

The falls prevention exercise principles underpinning the innovation will be presented with an emphasis on how and why they were integrated into the exergame. Patients' contributions that shaped the course of the project will be highlighted with video examples.

#### Key Practice Points:

- 'Clock Yourself' is a mind-motor exergame; developed for smartphones and adapted as a CD & workbook for those who struggle with apps.
- Translational research is everybody's business. It can and should be initiated by ordinary clinicians at the coalface.
- There is merit in pursuing low-tech digital innovations. Physiotherapists are well placed to facilitate the simplification of existing exercise technology so that the benefits can be enjoyed by less tech-savvy patient populations.

### CURRENT PRACTICES OF AUSTRALIAN CLINICIANS FOR TRAINING TWO-WHEEL BICYCLE SKILLS IN CHILDREN WITH CEREBRAL PALSY

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**Aim:**

Riding a two-wheel bicycle may be a goal for children with CP, however, current training practices are poorly understood. The aim was to explore current practices of physiotherapists (PTs) and occupational therapists (OTs) for training two-wheel bicycle skills in children with cerebral palsy (CP).

**Design:**

PTs and OTs working with children with CP in Australia were invited to complete a customised online survey from May-June 2016.

**Methods:**

A convenience sample of 157 clinicians participated (131 PTs, 26 OTs). The survey contained questions regarding current practice including: eligibility, initial assessment, training characteristics and evaluation. Multiple-choice responses were analysed using descriptive statistics. Short answer responses were analysed using content analysis within an International Classification of Functioning, Health and Disability framework.

**Results:**

Intellectual impairment and limited mobility were the most frequently reported contraindications. Ninety-eight percent of participants reported they would always initially assess goals, while most other components of assessment were Body Structures and Functions-related. Activity-based approaches, including task-specific and goal-directed training, were predominant (82% and 79% of participants respectively). Component-based approaches, including balance and strength training, were also reported (34% and 26% of participants respectively). Training characteristics were variable across setting, format, providers and dosage. Goal-related measures were the most commonly reported evaluation tool (35% of responses).

**Conclusions:**

While initial goal assessment appears standard in bicycle skills training, fewer clinicians use outcome measures to evaluate goals. Activity-based training appears predominant, however, variability in training characteristics reflect a lack of uniform practice. This information can inform development of evidence-based bicycle skills training.

## **DEVELOPMENT OF "MY WHIPLASH NAVIGATOR": AN ONLINE PACKAGE TO SUPPORT THE ASSESSMENT AND TREATMENT OF PEOPLE WITH WHIPLASH**

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**Aim:**

To develop an online tool to support recovery of people with whiplash.

**Design:**

A process analysis describing the development of an online support package.

**Methods:**

A tendering process was undertaken to select a suitable website developer. Following contract execution, fortnightly work-in-progress meetings were held to discuss design concepts, content, features and functionality. The research team provided the content of the website whilst the website developers ensured that the materials were suitable for website use. Concurrently, stakeholder surveys and focus group discussions were conducted among healthcare providers and patients to further inform website development. The development process involved collaboration, negotiation, trial and error, and extended time frame for delivery of the website.

#### Results:

The primary outcome of the project was an interactive, user-friendly website that included 3 sections. The first section involves an online version of a clinical prediction rule that stratifies patients into low and medium/high risk of non-recovery. Upon completion, feedback is provided and the patient is directed to resources that would assist recovery, with information targeted to their risk category. The second section includes guideline-based resources for primary care practitioners. The third section provides specialist practitioners information about more complex assessments and resources to assist with management decisions. The website also links patients and their healthcare providers, which facilitates the process of referral of patients at medium/high risk of non-recovery to specialist practitioners.

#### Conclusion/Key Practice Points:

- The website provides access to evidence-based information and resources to assist patients and healthcare providers in optimising recovery after whiplash.

### DIFFERENTIAL EFFECT OF FUNCTIONAL ELECTRICAL STIMULATION CYCLING ON THIGH MUSCLES, IN COMPARISON TO PASSIVE CYCLING, IN ACUTE SPINAL CORD INJURY.

**Panisset M<sup>1</sup>**, El-Ansary D<sup>1</sup>, Galea M<sup>1</sup>

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The SCIPA Switch-On trial compared the efficacy of functional electrical stimulation–assisted cycling (FESC) and passive cycling (PC) to attenuate muscle atrophy after acute spinal cord injury (SCI). Both interventions examined were safe, feasible, and well tolerated early after SCI. There was considerable variability in maximum thigh cross-sectional area within both groups. This exploratory analysis describes the differential effect on thigh muscle volume of each intervention.

#### Design:

Exploratory analysis of secondary outcomes (thigh muscle volumes) from a randomized controlled trial conducted from 4-16 weeks post-injury. Effect sizes were calculated for participants who completed >9 weeks of intervention, using Cohen's d. Individual results will be presented (case series).

#### Results:

The largest between-group effect size was found in the biceps femoris longus (BFL), vastus medialis and rectus femoris (0.74, 0.63 and 0.62, respectively). The greatest hypertrophy from FESC was observed in biceps femoris and rectus femoris (7.0-7.6%) although all confidence intervals crossed zero. Maximum cross sectional area of the quadriceps (d=0.57) and whole thigh muscle volume (d=0.50) appeared to provide a more sensitive outcome measure than maximum thigh muscle cross-sectional area (d=0.42).

#### Key Practice Points:

- FESC seems to preferentially affect the superficial muscles
- Passive cycling showed least anti-catabolic effects on the biceps femoris longus and the vastus medialis in this sample
- Effect sizes reported here will inform future study design.
- Maximum cross-sectional area of the quadriceps may be the most responsive outcome measure for comparing these interventions.

### EARLY HOME-BASED PULMONARY REHABILITATION FOR COPD EXACERBATIONS: A FEASIBILITY STUDY.

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#### Aim:

To investigate whether an 8-week home-based pulmonary rehabilitation program is feasible after hospitalisation for a COPD exacerbation.

Design:  
Feasibility study

Methods:

Patients hospitalised for an exacerbation of COPD were invited to participate in an 8-week home-based pulmonary rehabilitation program starting early following hospitalisation (1 to 3 weeks). The program consisted of one home visit followed by seven once-weekly telephone calls performed by a physiotherapist, with outpatient assessments before and after the program.

Results:

Of 118 patients screened, 25 meet the inclusion criteria. Ten eligible patients declined to take part. From 15 who accepted, ten came to the first assessment and 8 completed the program. Participants (n=10) had mean age  $75 \pm 8$  (SD) years and FEV1  $62 \pm 31$  % predicted. There was significant improvement in 6-minute walking distance ( $308.8 \pm 130.8$  m vs  $384.4 \pm 149.1$  m;  $p=0.009$ ) however improvements in quality of life were not consistent across domains.

Conclusion/ Key Practice Points:

- Home-based PR program starting early after hospitalisation improves exercise capacity for those who can complete the program. However, many patients decline or do not attend initial assessment.
- This model of home-based rehabilitation did not fully overcome the barriers to participation in pulmonary rehabilitation following an exacerbation of COPD.

## EARLY PRESENTATION OF SPONDYLOLISTHESIS IN CHILDREN WITH OSTEOPENIA IMPERFECTA

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Aims:

To determine the effect of disease characteristics and medical management on the presentation and progression of spondylolistheses in children with Osteopenia Imperfecta.

Design:  
Retrospective chart audit

Methods:

Records of 140 children with Osteopenia Imperfecta attending a tertiary centre between 2005 and 2015 were reviewed. The presence or absence of spondylolisthesis was measured on lateral x-rays as a percentage slip, then graded one through four using the Meyerding Classification. Demographic and medical information including presence or absence of scoliosis, basilar invagination, hypermobility, type of bisphosphonate used and age commenced, were collected from patient records.

Results:

The mean follow-up period was 6.8 years (SD 4.38 years). Prevalence of spondylolisthesis was 42.9% overall, with spondylolisthesis significantly more prevalent and presenting earlier in children with Type III (91%, mean 2.02 years), than Type IV (50%, 7.8 years) and Type I (32%, 6.01 years) ( $p < 0.001$ ). The grade of spondylolisthesis remained stable throughout follow-up in 70% of children with 17% progressing. There were no significant differences in the disease characteristics between children with and without a spondylolisthesis or those whose spondylolisthesis remained stable or progressed. There was a large, significant correlation between age bisphosphonates commenced and initial age of spondylolisthesis in children who commenced bisphosphonates before spondylolisthesis was seen ( $r = 0.923$ ,  $p < 0.001$ ).

Conclusion/Key Practice Points:

- Spondylolistheses present early and are prevalent in children with Osteopenia Imperfecta, particularly in more severe disease types.
- Earlier initiation of bisphosphonates may be lowering the age at which a spondylolisthesis develops.

## EFFECT OF A 3-WEEK INTENSIVE THERAPY INTERVENTION ON PHYSICAL PERFORMANCE OF CHILDREN WITH NEUROLOGICAL CONDITIONS: A CASE STUDY SERIES

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### Aim:

To investigate if a 3-week intensive therapy intervention can improve the physical performance of children who have neurological conditions?

### Design:

Prospective case study series.

### Method:

Twelve children (males: n = 6; females: n = 6, aged 2.42 to 4.75 years) diagnosed with neurological conditions participated in intensive modes of therapy (IMOT) for 2-6h/day over 5 days/week for 3 weeks of varied mobility-related interventions. IMOT included MEDEK therapy, NeuroSuit, SpiderCage therapy, Occupational therapy / sensory integration and conventional Physiotherapy. Goal Attainment Scale (GAS) and the Canadian Occupational Performance Measure (COPM) were completed with participant's parent's pre and post intensive intervention.

### Results:

Mean GAS composite change score represented a 176% increase in physical function relating to mobility goals. A 102% mean increase in performance and 104% mean increase in satisfaction was reported by parents on the COPM for children's physical goal-related activities. Paired samples t-tests revealed significant ( $p < 0.001$ ) improvements in mean performance for all GAS and COPM goals after completing the 3-week intensive therapy program.

### Conclusion:

A 3-week intensive therapy program demonstrated significant improvements in functional mobility related GAS and COPM outcomes in children with neurological conditions. Due to the small sample size and lack of control group, therapists may consider using these findings with caution, to guide families who are considering participating in intensive therapy programs.

### Key Practice Points:

- Intensive modes of therapy are becoming more common in physiotherapy practice.
- An intensive mobility-related intervention delivered over a 3 week period can achieve desired goal-related performance and parent satisfaction.

## EFFECTIVENESS OF SELECTED EXERCISES PROGRAM ON SPORTS HERNIA: RANDOMIZED CONTROL TRIAL

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**Aim:** To determine whether selected exercises program that involves effortful muscle contractions, core stability, balancing exercises, progressive resistive exercises, and running activity is effective after sport hernia or not?

**Design:** Single blinded randomized controlled trial.

**Method:** Forty soccer players with sports hernia were randomly divided into two equal groups, Group A (selected exercises program), Group B (conventional treatment). The methods of assessment included visual analogue scale, hip internal and external rotation assessment and outcome measures. Group A received conventional treatment (Heat, Massage, Transcutaneous Electrical Nerve Stimulation and Mobilization) plus selected exercises program while Group B received only conventional treatment. Treatment program extended for two months, three sessions per week, while evaluation was done pre and post treatment.

Results: Comparison between both groups post treatment revealed a significant decrease in visual analogue scale of group A compared with that of group B ( $p < 0.001$ ). The percentage of decrease in visual analogue scale for group A and B was 80.25% and 41.93% respectively, while there was no significant difference in internal rotation ( $p = 0.54$ ) and external rotation ( $p = 0.26$ ) between both groups post treatment. There was a significant improvement in outcome measures between both groups post treatment ( $p = 0.01$ ) as 13 patients in group A and only three patients in group B returned to sport activity without groin pain.

Conclusion/ Key Practice Points:

- It was concluded that active exercises were effective in sports hernia management in expression of decreasing pain and return to sport.

#### EFFECTS OF BODY FATIGUE ON ANKLE JOINT ANGLE DURING LANDING. A SYSTEMATIC REVIEW WITH META ANALYSIS.

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Aim:

To determine the effects of body fatigue on ankle joint angle during landing in healthy participants.

Design:

Systematic review with meta-analysis

Method:

The databases CINAHL, EMBASE, MEDLINE(Ovid), SPORTDiscus and PEDro were searched until September 2016. The search strategy identified studies investigating the effects of fatigue on ankle sagittal plane range of motion (ROM) at landing from a jump. Quality of the studies was assessed using the PEDro scale. Standardised mean difference (SMD) between pre and post fatigue measures were calculated and a meta-analysis was performed using a random effects model. Meta-regressions were conducted to explain study heterogeneity.

Results:

Out of 338 records identified in databases, 12 fulfilled the inclusion/exclusion criteria. The overall quality of the papers was considered moderate. Fatigue protocols and types of jumps were substantially different among studies. Six studies involved double leg jumps including drop landing (3) and counter movement jumps (CMJ) (3). The remaining involved single leg jumps with drop landing (2), CMJ (1), hop (2) and forward side jump (1). Seven studies were included in the meta-analysis. Findings from the meta-analysis showed a tendency of ROM to increase in the sagittal plane after the fatigue at landing, with a pooled SMD of 0.14 (95% CI 0.01-0.27). Variables could not explain the high heterogeneity ( $I^2 = 83\%$ ) of the included studies.

Conclusion/ Key Practice Points

- Regardless of the differences seen in fatigue protocols, they seem to alter ankle joint kinematics.
- Fatigue seems to increase ankle ROM at landing, which could be related to injury risk.

#### EFFECTS OF ISOMETRIC EXERCISE IN PATIENTS WITH LATERAL EPICONDYLALGIA: RANDOMIZED CONTROL TRIAL

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Aim:

To investigate the effect of a low cost 8-week home program of graded isometric exercise compared to wait and see on clinical outcomes, measures of pain sensitivity and endogenous analgesia in patients with lateral epicondylalgia.

Design:

Randomised clinical trial, concealed allocation, assessor blinding

**Method:**

Patients with a primary clinical diagnosis of unilateral lateral epicondylalgia of longer than 6 weeks' duration were randomised to either wait and see or an 8-week home exercise program. During a single session with a Musculoskeletal Physiotherapist, patients assigned to exercise were instructed to complete a standardised daily program of isometric wrist extension by holding a water flask. Maximal strength testing of their unaffected wrist was used to prescribe the starting load. The exercise volume (time by load) was increased weekly in standardised increments. All participants received written and verbal reassurance and specific advice regarding activity modification. Primary outcome measures were 8-week global rating of change and difference in Patient-rated Tennis Elbow Evaluation. Secondary outcome measures were changes in pain intensity, pain-free grip, thermal and mechanical pain thresholds and conditioned pain modulation at 8-week follow-up.

**Results:**

Thirty patients (30% females, mean age 48 years) have been randomised (17 exercise, 13 wait and see). Final study enrolment and 8 week testing will be completed by September. Compliance to the exercise program has been high (overall 95%) with all patients tolerating the prescribed load and volume.

**Conclusion/ Key Practice Points:**

- 8-week program of isometric strengthening exercises appears feasible with good compliance.

**EVALUATING A NOVEL PARTNERSHIP BETWEEN PULMONARY REHABILITATION AND AQUATIC PHYSIOTHERAPISTS IN DELIVERING AN AQUATIC PULMONARY REHABILITATION PROGRAM: PROTOCOL**

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**Aim:**

To evaluate a novel partnership between experienced pulmonary rehabilitation and aquatic physiotherapists in delivering an aquatic pulmonary rehabilitation program.

**Design:**

Prospective cohort study with short-term measures.

**Method:**

Pulmonary rehabilitation and aquatic physiotherapists will collaborate and educate each other in their areas of expertise to develop the aquatic pulmonary rehabilitation program structure, safety mechanisms and documentation. People attending for pulmonary rehabilitation assessment will be screened for inclusion and eligible participants offered a choice of aquatic pulmonary rehabilitation or the traditional hospital land-based program. The aquatic program will be delivered by the specialist aquatic and pulmonary rehabilitation physiotherapists and will mirror the traditional land-based program in content.

**Results:**

Both process outcomes and participant outcomes will be reported. Process outcomes will identify the ratio of people who choose the aquatic program over the traditional land-based program and program completion rates. Participant outcomes will examine change in health-related quality of life and exercise capacity post intervention. Participants will complete a questionnaire examining the acceptability of the aquatic program. The physiotherapists will also complete a purpose-designed questionnaire to evaluate the development process and program delivery at the end of the intervention.

**Conclusion/Key Practice Points:** This study will:

- Evaluate the success of a partnership between experienced pulmonary rehabilitation and aquatic physiotherapists in delivering an aquatic pulmonary rehabilitation program.
- Add to the evidence of the efficacy of aquatic training on health-related quality of life and exercise capacity in people referred to pulmonary rehabilitation.

## EVALUATION OF A SUPERVISED OUTPATIENT EXERCISE PROGRAM FOR CANCER PATIENTS

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<sup>1</sup>Gold Coast Health, Southport, Australia

### Aim:

The primary objective is to investigate effectiveness; measured by improvements in physical impairments and function, quality of life (QOL) and fatigue, of a newly implemented evidence-based outpatient exercise program for people undergoing cancer treatment. The secondary objective is to determine feasibility of the program.

### Design:

A descriptive longitudinal study design with pre- and post-intervention assessment.

### Method:

Nine participants undergoing or recently completed cancer treatment took part in a weekly class consisting of circuit-based exercises supervised by a physiotherapist and assistant for 12 weeks. An individualised program was created consisting of cardiovascular, strength and balance activities. Pre-intervention assessment included assessment of physical impairments and functional restrictions, MOS SF-36, FACIT-F and Scot-PASQ. Assessments were repeated post-intervention, with an additional feedback questionnaire. Data was analysed using SPSS.

### Results:

All participants had a diagnosis of breast cancer, and underwent surgical management. 66% underwent either chemotherapy or radiation therapy or both. 66% continued with hormonal therapy. Pre-intervention measures illustrate the participants had good physical functioning and general health, experienced mild to moderate pain levels, and minimal emotional wellbeing problems. Energy and social functioning was most affected in QOL measures. Adherence to the classes was good at 78%. No adverse events were reported. Preliminary post-intervention measures show improvement in outcome measures and positive feedback from participants.

### Conclusion/Key Practice Points:

- Implementation of an exercise program for people undergoing, or recently completing cancer treatment is feasible based on participant report and attendance rates; and has potential for improvements in QOL and fatigue.

## FACTORS ASSOCIATED WITH CARE-SEEKING FOR LOW BACK PAIN

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<sup>2</sup>Department of Human Anatomy and Psychobiology, University of Murcia, , Spain

### Aim:

To investigate the factors associated with people's increased risk of seeking care for low back pain.

### Design:

Observational longitudinal twin study.

### Method:

Longitudinal data regarding low back pain was collected from 1085 twins enrolled in the Murcia Twin Registry, Spain. All twins answered self-reported questions about the prevalence and whether they sought care for their low back pain. Lifestyle and demographic factors such as age, sex, leisure physical activity, sleep quality, and symptoms of depression were explanatory variables. Firstly, associations were investigated using a logistic regression of the total sample, followed by a matched within-pair twin case-control analyses.

### Results:

Poor sleep (OR 1.28, 95% CI 0.92 to 1.77) and symptoms of depression or anxiety (OR 1.26, 95% CI 0.83 to 1.91) were the main factors that increased the risk of people seeking care for low back pain. The risk for seeking care was stronger in the subsequent case-control analysis for both sleep quality (OR 1.32, 95% CI 0.71 to 2.4) and symptoms of depression or anxiety (OR 1.76, 95% CI 0.75 to 4.16), indicating that genetics

or early shared environment did not influence the results. Women were also less likely to seek care compared to men (OR 0.39, 95% CI 0.17 to 0.91).

**Conclusion/Key Practice Points:**

- Men with poor sleep or symptoms of depression and anxiety have a higher risk of seeking care for low back pain, irrespective of genetic or early shared environmental influences.

## FEEDBACK PROVIDED TO NEUROLOGICAL PATIENTS UNDERGOING INPATIENT REHABILITATION: A COMPARISON OF STANDARD CARE PHYSIOTHERAPY AND VIDEO AND COMPUTER-BASED THERAPY

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**Aim:**

This study aimed to characterise therapist feedback provided to patients receiving video and computer-based therapy (VC), and to compare this to standard care physiotherapy (SC).

**Design:**

Prospective observational study.

**Method:**

Rehabilitation inpatients (metropolitan hospital Adelaide) receiving VC in addition to SC were observed. The protocol involved 30-minute observations of 2 SC and 2 VC sessions per patient, recording in two-minute increments all characteristics of therapist feedback, categorised by: modality (visual, auditory, haptic), timing (concurrent, terminal), focus of attention (external, internal) and content (knowledge of performance (KP), knowledge of results (KR), performance error and correct performance).

**Results:**

Six patients (3 males, average age 64.2 years) and nine therapists (5 junior, 4 senior) were observed in a total of 21 sessions (10 SC and 11 VC). During VC, compared to SC, therapists provided patients with roughly five times the amount of KR ( $2.5 \pm 5.7$  and  $0.50 \pm 1.0$ ,  $p = 0.09$ ), four times more feedback on correct performance ( $p < 0.001$ ); double the amount of concurrent feedback ( $p = 0.03$ ); and significantly increased use of auditory ( $p = 0.04$ ) and haptic feedback ( $p = 0.01$ ). A post-hoc analysis showed that level of therapist experience (junior versus senior) did not influence the patterns of feedback (all  $p > 0.05$ ).

**Conclusion:**

In VC therapists do not solely rely on feedback from devices. They present a larger amount of feedback, characterised by increased use of concurrent, visual and haptic feedback, focused on KR and correct performance.

## FUNCTIONAL WALKING ABILITY OF CHILDREN WITH OSTEOGENESIS IMPERFECTA

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**Aims:**

To investigate the functional walking ability of children with Osteogenesis Imperfecta in comparison to healthy peers, and to determine the extent to which disease characteristics affect performance.

**Design:**

Cross-sectional study

**Methods:**

61 school-aged children with Osteogenesis Imperfecta were recruited from a tertiary clinic. Functional walking ability was assessed with the six minute walk test and the timed up and go test. Medical history was

collected via interview and review of patient records including recent dual energy xray absorptiometry results. Unpaired t-tests compared results to contemporary normative data and stepwise linear regression investigated the contributions of disease characteristics to performance on each measure.

#### Results:

Participants had a mean age of 11.91 years. Compared to healthy peers, children with Osteogenesis Imperfecta had reduced functional performance on both the six minute walk test (mean difference -111 metres, 95% CI -150 to -72 metres) and the timed up and go test (mean difference -0.56 seconds, 95%CI 0.23 to -0.89 seconds). Forty-seven percent of the variance in the six minute walk test distance was explained by lean tissue mass ( $\beta = 0.6$ ) and number of unstable joints reported by children ( $\beta = -0.26$ ) ( $p < 0.001$ ). Lean tissue mass ( $\beta = -0.41$ ) explained 17% of the variance in the time to complete the timed up and go test ( $p = 0.006$ ).

#### Conclusion/Key Practice Points:

- Children with Osteogenesis Imperfecta have reduced walking ability compared to healthy peers.
- When aiming to improve walking ability, treating physiotherapists should prioritise increasing muscle mass and improving joint stability.

### GAIT REHABILITATION OF A BOXER PUPPY WITH POST-VACCINATION SYNDROME

#### **Nicholson H<sup>1</sup>**

<sup>1</sup>Whole Family Health, St Marys, Australia

#### Background:

A four-month-old boxer puppy was referred following diagnosis of tetraplegia from post-vaccination syndrome.

#### Aims / Objectives:

This case study will provide participants with an awareness of a very rare cause of tetraplegia and the challenges associated with the neurological rehabilitation of a growing puppy.

#### Approach:

The presenter will use photographs, videos and objective measures to describe the physiotherapy techniques used to rehabilitate this growing puppy's gait.

#### Conclusion / Key Practice Points: Participants will have an awareness of:

- The presenting signs and proposed pathophysiology of post-vaccination syndrome;
- The application of physiotherapy techniques, including the use of an underwater treadmill, to rehabilitate the gait of a growing puppy with severe tetraplegia.

### GOAL SETTING PRACTICE IN CHRONIC LOW BACK PAIN. WHAT ARE WE REALLY DOING?

#### **Gardner T<sup>1</sup>**

<sup>1</sup>University of Sydney, Sydney, Australia

#### Introduction:

Health professionals' attitudes and beliefs are an important factor in influencing clinical behaviour. Goal setting is a common component of CLBP guidelines worldwide. It is not known what the current goal setting practice is in CLBP.

#### The aims of the study were to explore:

1. What is the current goal setting practice in CLBP amongst physiotherapists?
2. What are the perceived barriers to goal setting in CLBP?
3. Does therapist treatment orientation effect goal setting practice?

Method: A cross-sectional observational survey of a cohort of physiotherapists practicing in NSW was undertaken. Descriptive statistics were calculated to summarise data on therapist demographics, current goal

setting practice and perceived barriers to goal setting. ANOVA with linear contrast analysis was conducted to explore the relationship between treatment orientation and current components of goal setting practice.

Results: A total of 239 responses were returned (25.45% response rate). Setting goals and involving the patient in goal setting was mostly seen as a high priority amongst respondents. The most common barriers perceived to goal setting (35.3%) were time constraints (35.3%) and a perceived lack of skill and confidence (24.75%). There was a significant association between biomedical orientation and patient involvement in goal setting ( $P=0.09$ ) with a higher biomedical score associated with a lower patient involvement score.

Conclusion: Goal setting is perceived as a high priority amongst physiotherapists. The practice of goal setting remains varied and a discrepancy exists between what physiotherapist's value and what they practice in regards to goal setting in CLBP.

## GROUP CONSTRAINT-INDUCED MOVEMENT THERAPY FOR UPPER LIMB REHABILITATION POST STROKE: A FEASIBILITY PRE-POST INTERVENTION DESIGN

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Purpose:

This pre-post intervention design examined the feasibility of delivering a group CIMT program for upper limb rehabilitation post stroke.

Methods:

Three stroke survivors (mean age: 63.7 years) participated in a group constraint-induced movement therapy program for three hours three times a week over a three week period. The group was delivered by a physiotherapist and a master's physiotherapy student. The exercises targeted varied arm and hand activities at six different stations such as using utensils for eating, and reaching to targets.

Results:

Mean time post stroke was 15.3 months. All participants completed all nine classes. Although unable to use their affected arm and hand pre-intervention, all participants were able to use their affected arm to some degree post intervention. The effects of the intervention on the Motor Activity Log–Amount of Use Scale ( $p = 0.043$ ), Wolf Motor Function Test-Functional Ability Score ( $p = 0.049$ ), and Stroke Impact Scale- Physical Domain ( $p = 0.010$ ) were significant.

Conclusion/Key Practice Points:

- The intervention was feasible and acceptable to all participants. Delivering group CIMT may be a resource efficient way to improve accessibility to CIMT, which is currently not widely implemented in practice.
- Whilst these initial findings are positive, additional research is needed to confirm these preliminary results.
- Funding has been obtained to conduct five more groups involving up to 30 participants for further feasibility testing.

Funding Acknowledgements: Flinders University Seeding Grant

Ethics Approval: SAHREC-project 238.16

## HEALTH CARE BARRIERS AMONG WOMEN WITH PELVIC PAIN

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Aim:

To evaluate the health care barriers perceived by women with pelvic pain.

Design:

Cross-sectional, observational study.

#### Methods:

An online survey was undertaken by 650 women with pelvic pain ( $n = \text{mean(SD) age } 33(9) \text{ years}$ ) to ascertain their perceived barriers to receiving health care. Women were asked, 'How significant have the following barriers been in your search for pelvic pain relief?', with a list of 14 barriers presented. Women were asked to respond to each barrier using a numerical rating scale of 0-10, anchored with 'This is not a significant barrier to my health care' and 'This is a huge barrier to my health care', respectively. Women could also add their own barriers in an open-response question. Differences between the barriers were assessed using a Kruskal-Wallis H test.

#### Results:

There was a significant difference between the barriers ( $H(3) = 376.771, p < 0.001$ ). Post-hoc analyses revealed two barriers were statistically significantly greater than all other barriers ( $p < 0.042$  for all): 'There is not enough research done on pelvic pain' and 'There is not enough public awareness about pelvic pain'.

#### Conclusion/Key Practice Points:

- A lack of research and a lack of public awareness about pelvic pain is perceived to be the two greatest health care barriers for women with pelvic pain.
- The health system should aim to address these two barriers to ensure that women with pelvic pain receive effective and timely health care.

#### HOW IS SYMPTOM FLARE DEFINED IN MUSCULOSKELETAL CONDITIONS: A SYSTEMATIC REVIEW

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#### Aim:

To systematically review processes undertaken to derive or validate definitions of the term "flare" (or "flare up") in the 12 most burdensome musculoskeletal conditions.

#### Design:

Systematic review.

#### Method:

Musculoskeletal conditions considered were the "major" (i.e. hip and/or knee osteoarthritis, low back pain, rheumatoid arthritis, gout and neck pain) and "other musculoskeletal conditions" (i.e. systemic lupus erythematosus, ankylosing spondylitis, psoriatic arthritis, juvenile rheumatoid arthritis, osteomyelitis, fibromyalgia and shoulder pain) determined by Global Burden of Disease (GBD) 2010 Study. We used the search term "flare" combined with each of those conditions to conduct a systematic search in MEDLINE, EMBASE CINAHL, AMED, PsycInfo and Lilacs from the earliest record to February 2017. No restriction was applied on study design or language. Studies were considered eligible if they; (1) derived a flare definition (phrase or group of domains), or (2) assessed validity of flare definitions or domains.

#### Results:

Studies deriving flare definitions were found for 9/12 musculoskeletal conditions. Validation studies were identified for 4/12. Diverse methods have been used to derive and/or validate a definition for flare or its domains in musculoskeletal conditions with varying consultation with patients, clinicians and experts. Definitions encompassed multiple domains and mostly included pain, impact on function, joint symptoms, and psychological elements. Validation compared flare definitions/domains against measures of disease activity, clinicians' diagnosis, response to drug therapy or a combination.

#### Conclusion/ Key Practice Points:

- Flare in musculoskeletal conditions is considered to be a multilayered experience. Greater breadth of flare domains was used when patient's perspectives were considered.

## HOW TO INCORPORATE PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR ADVICE INTO USUAL CONSULTATIONS FOR MUSCULOSKELETAL PROBLEMS

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### Background:

Physiotherapists are ideally placed to provide advice/counseling about physical activity (PA) and sedentary behaviour (SB) to improve health outcomes. They have the background, training and access to people at risk of non-communicable disease (NCD) and acknowledge this should be part of their role. Despite this physiotherapists are under utilised in this role.

### Aim:

To increase knowledge of a variety of evidence-based interventions and their implementation to increase PA and decrease SB in people presenting for management of musculoskeletal (MS) conditions.

### Learning outcome:

Participants will be able to implement simple evidence-based interventions to increase PA and decrease SB into their usual treatment sessions.

### Approach:

This session will commence with a 15-20 minute presentation on evidence-based PA and SB interventions that are suitable to implement into usual practice. Participants will then workshop how they might incorporate PA and SB advice/ counselling into practice as well as plan that advice based on case scenarios. (10-15 mins). Finally, there will be an interactive discussion on the ease of implementation, identification of barriers and strategies on how to overcome them as well as accessing resources to aid implementation. (10-15 mins)

### Key Practice Points:

Participants will be able to

- Implement evidence based PA and SB advice/counseling into usual practice
- Identify barriers to implementing PA and SB advice and develop strategies to overcome them
- Implement practical solutions for motivating patients to change behaviour.

## HOW TO TEACH A PRACTICAL SKILL AND GIVE EFFECTIVE FEEDBACK: APPLICATIONS AND LEARNING POINTS FROM DEVELOPMENT OF A TRAINING COURSE

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### Background:

There are a variety of teaching qualifications and specialised teaching courses available to healthcare professionals; however applying educational theory in clinical training can be challenging. The development of a “train-the-trainer” course is offered as one example of efforts to scale up services in low resource settings. The lessons learned may be useful for development and implementation of other medical training programmes and one-on-one teaching. No prior knowledge is assumed.

### Aims/objectives:

To introduce and demonstrate components of the development and teaching of a training course that was designed to increase practical skills.

Learning outcomes include the understanding of the role of adult learning, with the use of examples from the development of a “train-the-trainer” course and improvement in participant’s knowledge and skill in how to teach a practical skill and how to give effective feedback.

### Approach:

A large group presentation (10mins) will introduce the topic and will be followed by a practical demonstration of case scenarios (10mins). Two approaches from our research will be demonstrated and practiced in small

groups (20mins). These techniques will include a 4-step approach to teaching a practical skill and a framework for giving effective feedback. Handouts of the Powerpoint will be provided.

#### Key Practice Points:

On completion of this session participants will be able to:

- Understand key concepts of effective training and learning
- Demonstrate the principles of teaching a practical skill
- Identify strategies to give effective feedback.

## HYDROTHERAPY FOR OBESITY

### **Warburton M<sup>1</sup>**

<sup>1</sup>*Gateway Physiotherapy, Wishart, Australia*

#### Background:

Case study investigating body composition and mental well-being changes following hydrotherapy with a morbidly obese person 57 year-old Lady, independently mobile with three stable chronic conditions. Body weight (BW) 110.8kg's; Body fat (BF) % 52.5; mental well-being 47/70 on the Warwick-Edinburgh Well-Being Scale (WEWBS) Physical activity is an important part of weight management with the obese population and hydrotherapy may be a suitable and effective exercise environment to safely undertake physical activity, especially when land-based activities are unfeasible Buoyancy, warmth, pressure, viscosity and turbulence are elements of hydrotherapy that offer the obese a unique hydro-therapeutic environment to execute a physical activity program.

#### Methods:

Hydrotherapy was provided for 8-weeks, 2xweek, 45-minute session duration. Pool temperature 32.5 degrees centigrade. Pool length 20-metres. Sessions included pool mobility, encouragement and supervision, warm up/cool down, continuous and high intensity interval training, body weight exercises of large muscle groups, stretching exercises.

Outcomes were completed weeks 0 and 8 via BW, BF % and mental well-being using the WEWBS

#### Results:

BW, BF% and mental well-being all improved. BW decreased to 106.0kg's (-4.3%); BF % decreased to 50.7% (-3.4%) and mental well-being improved 21 points to 68/70 on the WEWBS

#### Conclusions:

Hydrotherapy can be a beneficial hydrotherapeutic option for the obese when land-based activity is unfeasible It provides a relatively safe environment for mobility and exercise, and allows physical activity to be undertaken – important for the obese population

#### Implications:

Hydrotherapy is a measurable therapeutic exercise option for the obese population

## IDENTIFICATION OF POSTURAL ABNORMALITY IN YOUNG ADULTS WITH SEVERE CEREBRAL PALSY

### **Holmes C<sup>1</sup>**, Morgan P, Brock K

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#### Aim:

To describe the nature and extent of postural asymmetry in non-ambulant young adults with cerebral palsy (CP) in comparison to age-matched peers without movement disorders using a bedside tool. Windsweeping is characterised by external rotation / abduction of one leg and internal rotation / adduction of the other leg.

#### Design:

Case series

#### Method:

Participants were six non-ambulant adults with CP (five male, median age 19, range 18 to 23) and 10 healthy controls (five male, median age 20, range 18 to 25). All participants underwent a single measurement of spinal and pelvic/hip alignment using a medical device, the Goldsmith Indices of Body Symmetry (GloBS). A windsweeping index was calculated by measuring the difference between the left and right angle between the legs and pelvis.

#### Results:

All participants completed the testing. For those with CP, the median windsweeping index was 8.6 (IQR 2, 45, range 1 to 74.2), compared to the healthy controls with a median windsweeping index of 0.9 (IQR 0.2, 1.5, range 0 to 6.7).

#### Conclusion / Key Practice Points:

- As anticipated, the healthy controls showed minimal evidence of windsweeping. In those with CP, three participants had scores within the range of the healthy controls, and three had marked windsweeping
- The GloBS procedure is well tolerated by adults with significant physical disability
- The GloBS appears able to identify and quantify postural abnormality in this population, making it potentially suitable for use in regular clinical monitoring.

#### IDENTIFYING THE KNOWLEDGE GAP REGARDING PHYSIOTHERAPY SERVICES PROVIDED IN RESIDENTIAL CARE FACILITIES WITHIN SOUTH EASTERN SYDNEY LOCAL HEALTH DISTRICT

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<sup>1</sup>*Prince of Wales Hospital, Randwick, Australia*

#### Aim:

To determine if physiotherapy services were available at residential care facilities within the South Eastern Sydney Local Health District (SESLHD), the type of physiotherapy services provided, the number of residents and physiotherapists at each facility and the number of days physiotherapy was available, in order to assist with discharge planning.

#### Design:

This study had a cross-sectional, observational design. As no appropriate validated tool existed addressing the aims of this study, a new survey was created.

#### Methods:

All residential care facilities within SESLHD were contacted via phone and invited to participate.

#### Results:

There were a total of 62 residential care facilities within SESLHD, and 84% (52/62) responded to the survey between March 2016 and March 2017. Physiotherapy was available at all of the residential care facilities that responded to the survey. The physiotherapy services provided were mobility training in 98% (51/52) of the facilities, massage in 69% (36/52), group classes in 50% (26/52), cardiorespiratory interventions in 40% (21/52), neurological rehabilitation in 27% (14/52) and hydrotherapy in 13% (7/52). The mean (SD) number of residents and physiotherapists were 82.6 (55.1) and 1.5 (1.1) respectively, and the number of days physiotherapy was available in a seven day week was 3.1 (1.4).

#### Conclusion/Key Practice-Points:

- Physiotherapy services were available at all residential care facilities within SESLHD that participated in the survey.
- The most common type of physiotherapy service provided was mobility training.
- A database of residential care facilities and physiotherapy services could assist with discharge planning.

## IMPACT ANALYSIS OF IMPLEMENTING AN AFTERHOURS PRIMARY CONTACT PHYSIOTHERAPY SERVICE IN A MAJOR TRAUMA EMERGENCY DEPARTMENT

**Henderson J<sup>1</sup>**, Gallagher R<sup>1</sup>, Brown P<sup>1</sup>, Smith D<sup>1</sup>

<sup>1</sup>*Hunter New England Local Health District, New Lambton Heights, Australia*

### Aim:

Does a primary contact ED physiotherapy service change ED discharge plans? Is emergency treatment performance (ETP) improved after hours by a primary contact Physiotherapy service?

### Design:

Prospective observational study on implementation of a 16 hour/ week service from October 2015 to February 2017.

### Method:

Prospective data collection on: presentation, diagnosis, management, orthopaedic referral, analgesia prescription and discharge destination from ED. Chi squared analysis compared differences in ETP performance, Z scores compared differences between orthopaedic referral, analgesia prescription and discharge destinations.

### Results:

294 shifts treating 1235 patients, with no adverse events and 100% agreement between Physiotherapists and doctor diagnosis. Mean length of stay for non-admitted primary contact patients 2hr 4 mins (SD 67 minutes) and 3hrs 23mins (SD 102 minutes) for non-primary contact ( $P<0.01$ ). 91% (range 77-100%) of primary contact patients met ETP compared to 69% (range 54-83%) for non-primary contact ( $P<0.01$ ). 11% reduction in both Orthopaedic referrals and analgesia prescriptions for primary contact patients ( $p<0.01$ ). 12% reduction in the number fracture clinic referrals for primary contact patients ( $p<0.01$ ), 9% increase in primary contact patients discharged to their GP ( $p<0.01$ ).

### Conclusion/ Key practice points

This service shows primary contact ED physiotherapy:

- Provides safe effective care without adverse events,
- Increases the number of musculoskeletal patients meeting ETP
- Reduces length of stay for musculoskeletal patients in ED
- Reduces Orthopaedic referrals and increases the number of discharges to GP's instead of fracture clinics.
- Reduces the amount of analgesia prescription on discharge.

## IMPACT OF THREE DIFFERENT EXERCISE PROGRAMS ON PAIN DISABILITY AND ENDURANCE OF TRUNK MUSCLES OF WOMEN WITH LOW BACK PAIN

Hamidi H, **Zangiabadi F**, **Pourkazemi F**, Amini Tehrani P

### Aim:

To determine the effect of eight weeks of physiotherapy exercises, Pilates and combination of them on pain, disability, and endurance of trunk extensor and flexor muscles of working women with chronic non-specific low back pain.

### Design:

Randomized controlled trial with concealed allocation, assessor blinding and intention-to-treat analysis.

### Method:

Women who demonstrated chronic none specific low back pain more than three months ( $n= 58$ , mean age  $\pm$  Standard Deviation (SD):  $33.03 \pm 5.56$  years) participated in the study. Prior to randomization, pain (Quebec pain questionnaire), disability (Oswestry Disability Questionnaire), flexor muscle endurance (Sit-up test), and extensor muscle endurance (Sorensen test) were measured. Participants were then randomly allocated into four groups: The study group I received Pilates + physiotherapy exercises ( $n=15$ ), the study group II received Pilates exercises ( $n=15$ ), the study group III received physiotherapy exercises ( $n=14$ ) for eight weeks and control group ( $n=14$ ) received no intervention. The outcome measures were recorded following the 8-weeks

intervention. Within-group differences were analyzed using paired t-test, and between-group differences were analyzed using ANCOVA.

**Results:**

All three interventions significantly reduced pain and disability and increased the endurance of trunk flexor and extensor muscles ( $p = 0.001$ ), but no significant difference was observed between the three intervention groups ( $P > 0.05$ ).

**Conclusion:**

The three 8-week exercise interventions (alone as well as in combination with each other) may improve function in working women with CNLBP through increasing muscle endurance, and reducing pain and disability. Programs are recommended to people with chronic non-specific low back pain.

## IMPROVING UPTAKE OF TACTILE ASSESSMENT AMONGST PAEDIATRIC THERAPISTS: A KNOWLEDGE TRANSLATION STUDY

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**Aim:**

To investigate the impact of a multi-faceted knowledge translation intervention on uptake of tactile assessments by paediatric therapists.

**Design:**

Pre-post observational study.

**Method:**

Eleven therapists from a state-wide community-based service participated (seven physiotherapists; four occupational therapists; 11 female). Intervention included a face-to-face workshop, provision of equipment, written information and demonstration videos and ongoing mentoring. Therapists completed an anonymous questionnaire investigating their knowledge, barriers to implementation and current practice of tactile assessments before and after intervention.

**Results:**

Therapists improved knowledge of (1) presence of tactile impairments in children with cerebral palsy (correct incidence - pre 18%; post 73%), (2) items appropriate for best-practice tactile assessment (e.g. Registration - pre 1%; post 82%; Localisation - pre 18%; post 91%) and (3) equipment required for implementation (e.g. Monofilaments - pre 1%; post 91%). Implementation of tactile assessments in clinical practice also improved slightly following intervention (Tactile assessment in <25% of children - pre=10, post=4; Report of no tactile assessments being completed each month - pre >50%; post 0%). Re-assessment of identified barriers showed pre-intervention perceptions of lack of equipment, knowledge and confidence had resolved, but new challenges of lack of time or treatment options and challenges with the funding model were identified.

**Conclusions/ Key Practice Points:**

- This knowledge translation intervention successfully improved therapists' knowledge of tactile assessment and addressed immediate clinical implementation barriers identified by staff.
- A multi-stage translation process is needed to identify and respond to immediate and emergent barriers to ensure implementation of tactile assessment in clinical practice.

## INCORPORATION OF NON-INVASIVE VENTILATION IN AN EARLY PHYSICAL TRAINING PROGRAM FOR PATIENTS WITH ACUTE EXACERBATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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### Aim:

To determine the impact of incorporating non-invasive ventilation in an early physical training for patients with acute exacerbation of chronic obstructive pulmonary disease

### Design:

Randomized controlled trial

### Method:

Screened patients who were receiving non-invasive ventilation with the diagnosis of acute exacerbation of chronic obstructive pulmonary disease, having compensating arterial blood gases and able to tolerate more than or equal to 1 hour off non-invasive ventilation were recruited. Those with unstable angina or myocardial infarction during the previous month were excluded.

Three subjects were recruited into study group from respiratory beds and four from general beds into control group. Subjects were asked to perform a 3-minute step training at fixed pace supported by non-invasive ventilation (study group) or without (control group). Training was performed twice a day until discharged.

### Results:

Preliminary results showed that there was a trend of increase in six-minute walk test distance in the study group (88.67±42.44 m) compared with the control group (65.25±33.00 m). Due to the small sample size, no significant difference was found in rate of perceived exertion changes (Study: 3.69±0.34; Control: 2.93±0.90), recovery duration (Study: 103.50±39.61 secs; Control: 115.00±31.22 secs) or number of days on NIV (Study: 6.00±1.73 days; Control: 5±1.83 days) between the groups.

### Conclusion/Key Practice Points:

- Incorporation of non-invasive ventilation during early physical training for patients with acute exacerbation of chronic obstructive pulmonary disease has potential benefits in improving their walking distance and other physical outcome measures.
- With continuing subject recruitment, its impact on liberating patients from NIV would be evaluated.

## INTEGRATING MOBILE HEALTH AND PHYSICAL ACTIVITY TO REDUCE THE BURDEN OF CHRONIC LOW BACK PAIN TRIAL (IMPACT): A FEASIBILITY STUDY

**Amorim A<sup>1</sup>**

<sup>1</sup>The University Of Sydney , Sydney , Australia

### Aim:

To investigate the feasibility of a randomized trial of a mobile-health supported physical activity intervention (IMPACT) in decreasing care-seeking, pain and disability in people with chronic low back pain, in terms of recruitment, completeness of data collection, and barriers to completing the study.

### Design:

Randomised controlled pilot trial.

### Method:

We recruited 32 people with chronic low back pain in Sydney, Australia. Participants were randomly allocated to the physical activity intervention (n = 16) or the standard care group (n = 16). The intervention group received one face-to-face health coaching session, twelve fortnightly health coaching telephone sessions and physical activity advice booklet supported by our WebApp and activity monitor (FitBit). The standard care group received the advice booklet only.

#### Results:

82 people were screened for eligibility, 48 met the inclusion criteria, and 32 agreed to participate. The majority of participants (63%) were male, mean age was 59 years (SD  $\pm$  9), with average pain intensity of 4.8/10 (SD  $\pm$  2.8), range (2 to 8) and the mean score for disability was 9.2/24 (SD  $\pm$  7.1) at baseline. Our target sample is 68 participants and the 32 participants included so far represent 47% of the target sample. The recruitment rate was 2.8%. A high rate of completeness of data was achieved for all measures. No other barriers were identified.

#### Conclusion:

The preliminary results of this study suggest that the definitive study is feasible in the present format. However, modifications in the protocol will be needed to achieve a higher recruitment rate.

### IS INTERACTIVE, MOTION-CAPTURE BASED REHABILITATION EFFECTIVE ON FUNCTIONAL OUTCOMES IN AN INPATIENT STROKE POPULATION?: A RANDOMISED CONTROL TRIAL

Bird M<sup>1,2</sup>, **Cannell J**<sup>1,3</sup>, Jovic E<sup>1,3</sup>, Rathjen A<sup>1,3</sup>, Lane K<sup>1,3</sup>, Tyson A<sup>1,3</sup>, Callisaya M<sup>1,4</sup>, Smith S<sup>5</sup>, Ahuja K<sup>1</sup>

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<sup>3</sup>Tasmanian Health Services, Launceston, Australia, <sup>4</sup>Menzies Institute for Medical Research, Hobart, Australia, <sup>5</sup>Southern Cross University, Coffs Harbour, Australia

#### Aim:

To compare the efficacy of novel interactive, virtual reality motion-capture rehabilitation to usual care stroke rehabilitation.

#### Design:

Randomised control trial with blinded assessors

#### Method:

Clients in 2 subacute rehabilitation units were individually randomised to usual care or intervention. In addition to functional retraining, participants had targeted individualised programs for up to an hour on week days, for eight to forty sessions. The intervention group used interactive, motion-capture software, while usual care group undertook therapy in a group class or 1:1 with a rehabilitation assistant. Between group differences were analysed for balance, upper limb and mobility outcomes.

#### Results:

Seventy-three clients after stroke (mean 22.1 days) attended mean 14 sessions. Both groups improved on the primary outcome functional reach [usual care mean = 3.3 cm (95% CI 0.6 to 5.9 cm), intervention mean = 4.1cm (95% CI 1.3 to 6.8 cm)], box and block test increased [usual care mean = 9.5 (95% CI 6.2 to 12.9), intervention mean = 7.6 (95% CI 4.1 to 11)] and timed up-and-go decreased [usual care mean = -8.4 seconds (95% CI -13 to -3.0), intervention mean = -10.1 seconds (95% CI -16.9 to -3.4)] (all p <0.04) with no between group differences.

#### Conclusion:

Interactive, motion-capture rehabilitation for inpatients after stroke produced similar functional improvements to usual care stroke rehabilitation.

#### Key Practice Points:

- Improvements were seen regardless of whether interventions were delivered by a physiotherapist or rehabilitation assistant.
- Use of technology may broaden effective therapy options for stroke survivors in rehabilitation.

## IS REAL-TIME TRANSABDOMINAL ULTRASOUND A RELIABLE TOOL TO ASSESS PELVIC FLOOR MUSCLE FUNCTION IN AN ACUTE POST-PARTUM POPULATION?

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<sup>1</sup>Mater Mothers' Hospital, Mater Health Services, South Brisbane, Australia

### Aim:

To determine the reliability of 2-Dimensional Transabdominal Real-time Ultrasound as an objective tool to assess Pelvic Floor Muscle function in the early post-partum period.

### Design:

Twenty-nine post-natal inpatients, aged 22-42 years, were recruited for this observational study. Transabdominal, Real-time Ultrasound assessment of the Pelvic Floor Muscles was performed within 3 days post-partum.

### Method:

Participants were eligible for inclusion if they had a vaginal birth, had passed urine since birth, could comprehend English and were  $\geq 18$  years of age. Participants were taught how to perform a Pelvic Floor Muscle contraction and three, six-second muscle contractions were captured in the transverse and sagittal plane. Two physiotherapists experienced in Ultrasound image capture and assessment, recorded bladder base movement in these images as a "lift", "depression" or "no movement".

### Results:

Intra-rater reliability results for transverse ( $\kappa=0.439-0.643$ ; 95% CI 0.196 to 0.908;  $p < 0.001$ ) and sagittal images ( $\kappa=0.512-0.765$ ; 95% CI 0.228 to 0.971;  $p < 0.001$ ) demonstrated moderate to substantial agreement. Inter-rater reliability for transverse ( $\kappa=0.563-0.873$ ; 95% CI 0.319 to 1.045;  $p < 0.001$ ) and sagittal ( $\kappa=0.738-0.865$ ; 95% CI 0.505 to 1.032;  $p < 0.001$ ) images demonstrated moderate to almost perfect agreement.

### Key Practice Points:

- Transabdominal Real-time Ultrasound is a reliable tool to assess Pelvic Floor Muscle function in the acute post-partum population.
- It may be used as an adjunct to verbal instruction, perineal inspection and transversus abdominis co-activation, to assist patient visual feedback and achieve correct activation of the Pelvic Floor Muscles in the early post-partum population.

## KNEE FRONTAL PLANE PROJECTION ANGLE DURING A SINGLE-LEG MINI-SQUAT IN BRAZILIAN NAVY CADETS AND ITS ASSOCIATION WITH HIP STRENGTH

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### Aim:

To investigate the effect of sex on knee frontal plane projection angle during a single-leg mini-squat and its association with isometric hip abductor and external rotator strength.

### Design:

Observational cross-sectional cohort study.

### Method:

164 male and 74 female Brazilian navy cadets volunteered to participate. The knee projection angles were measured in the frontal plane using Kinovea to analyse two-dimensional videos at the beginning and the end (maximal knee flexion) of a single-leg mini-squat. Hip abductor and external rotator strength were measured using a hand-held dynamometer.

### Results:

The mean frontal plane projection angle at maximal flexion was  $8^\circ$  valgus (SD =  $6.5^\circ$ ) for males and  $9^\circ$  valgus (SD =  $5.2^\circ$ ) for females. The mean change in angle from stance was  $4.6^\circ$  into valgus for males (range =  $28.0^\circ$  valgus to  $10.3^\circ$  varus) and  $4.5^\circ$  into valgus for females (range =  $15.0^\circ$  valgus to  $7.7^\circ$  varus). There were no

statistically significant differences between males and females in frontal plane knee motion. Greater external rotator strength was weakly correlated to less knee valgus during the mini-squat were ( $r=-0.162$ ,  $p=0.01$ ) while no other correlations were identified.

**Conclusion/Key Practice Points:**

- There is no significant difference in knee frontal plane projection angle between males and females during a single-leg mini-squat.
- No clinically relevant correlation exists between hip strength and frontal plane projection angle during a single-leg mini-squat.

## LAP-TRAY AND TRIANGULAR SLING COMPARED WITH A HEMI-SLING IN PREVENTING SHOULDER SUBLUXATION EARLY AFTER STROKE: A RANDOMISED TRIAL

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**Aim:**

To determine whether combining a modified lap-tray and triangular sling is more effective than a hemi-sling in preventing shoulder subluxation after stroke.

**Design:**

A prospective, randomised trial with concealed allocation, assessor blinding and intention-to-treat analysis.

**Method:**

Forty-six acute stroke survivors were included. The experimental group used a modified lap-tray while sitting and a triangular sling while standing to support the affected arm for four weeks. The control group used a hemi-sling while sitting and standing. The primary outcome was shoulder subluxation on X-ray. Secondary outcomes were upper limb activity, pain and contracture.

**Results:**

There was no significant difference between groups for shoulder subluxation (mean difference: -3mm, 95% CI -8 to 3). There was a trend in the experimental group for less pain at rest (mean difference: -0.7 out of 10, 95% CI -2.2 to 0.8) and during shoulder external rotation (mean difference: -1.7 out of 10, 95% CI -3.7 to 0.3) and for having less shoulder external rotation contracture (mean difference: -10 deg, 95% CI -22 to 2).

**Conclusion/Key Practice Points:**

- A lap-tray during sitting combined with a triangular sling during standing is no more effective than a hemi-sling in preventing subluxation, pain, contracture and activity limitation in acute stroke survivors.
- The use of a lap-tray during sitting and triangular sling during standing is not indicated as an alternative to a hemi-sling to prevent shoulder subluxation after stroke.
- Strategies with proven efficacy, such as electrical stimulation, should be considered.

## LIDOCAINE IONTOPHORESIS FOR POST MASTECTOMY INTERCOSTOBRACHIAL NEURALGIA

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**Aim:**

To investigate efficacy of lidocaine iontophoresis for neuropathic pain management in intercostobrachial neuralgia post mastectomy.

**Design:**

Single blinded randomized controlled trial.

**Method:**

Forty patients with partial or radical mastectomy were randomly divided into two equal groups, Group A (lidocaine iontophoresis), Group B (lidocaine patch). The methods of assessment included visual analogue scale and painDETECT questionnaire. Group A received lidocaine iontophoresis day after day for four weeks,

while Group B received lidocaine 5% patch (LIDODERM®) onto the painful area for 12 hours daily. Treatment program extended for one month, while evaluation was done pre and post treatment.

#### Results:

There was no significant difference between both groups in visual analogue scale ( $p = 0.14$ ) and painDETECT questionnaire ( $P = 0.32$ ) pre-treatment. Comparison between groups post treatment revealed a significant decrease in visual analogue scale and painDETECT questionnaire of group A compared with that of group B ( $p < 0.001$ ). The percentage of decrease in visual analogue scale for group A and B was 86.47% and 61.11% respectively, while the percentage of decrease in painDETECT questionnaire was 76% and 49.57% respectively.

#### Conclusion/ Key Practice Points:

- It was concluded that lidocaine iontophoresis was safe and effective method for intercostobrachial neuralgia management post mastectomy in expression of decreasing pain intensity and quality.

### LUMBOSACRAL RADICULAR SYNDROME: CLINICAL DECISION-MAKING, INCLUDING OUTCOMES MANAGEMENT, TO OPTIMISE SPINE SURGERY REFERRAL FOLLOWING A TRIAL OF PHYSIOTHERAPY

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#### Aim:

This pilot study aimed to test physiotherapist-directed outcomes management of lumbosacral radicular syndrome (within a novel clinical decision-making model) to document:

- i) recovery, or
- ii) failed conservative management, a recommended indication for spine surgery referral.

#### Design:

Prospective case series: patients with a diagnostic triage category of 'radicular syndrome' referred for physiotherapy.

#### Method:

Patients with radicular syndrome referred for a trial of physiotherapy were selected ( $n = 21$ ). Conservative management was patient-specific physiotherapy (education, dry needling and specific exercises). Age, baseline and 4-week follow-up of pain and function scores (pain: numerical scale 0-10; function: Oswestry Disability Index (ODI); Roland-Morris Questionnaire (RMQ)) were compared (t-tests) to distinguish recovery from failed conservative management and to potentiate referral for spine surgery.

#### Results:

Eleven patients recovered with physiotherapy; 10 proceeded to spine surgery. There were no significant differences between the surgery group (SG) and the non-surgery group (NSG) for age (SG  $55.5 \pm 17.8$ ; NSG  $50.5 \pm 14.2$ ,  $p=0.48$ ) or baseline scores: pain ( $p=0.68$ ); function ODI ( $p=0.78$ ), RMQ ( $p=0.72$ ). Post-intervention there were significant differences noted between those referred to surgery and the non-surgery group (pain:  $p=0.001$ ; ODI:  $p=0.004$ ; RMQ:  $p=0.0002$ ). Patients also improved significantly after spine surgery (pain:  $p=0.007$ ; RMQ:  $p=0.04$ ).

#### Key Practice Points:

- Physiotherapy outcomes management is key to measure and clarify evidence-based recovery or failed conservative management (an important indication for surgery referral).
- Pain and function outcomes, added to neurological assessment, enhance the quality and specificity of surgical referrals; this improves efficiencies in surgical selection and in collaborative care with spine surgeons.

## MEASURING MEANINGFUL CHANGES IN GAIT SPEED FOR CLIENTS UNDERGOING INPATIENT STROKE REHABILITATION.

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<sup>1</sup>University of Tasmania, Launceston, Australia, <sup>2</sup>University of British Columbia, Vancouver, Canada,

<sup>3</sup>Tasmanian Health Service, Launceston, Australia

### Aims:

To report findings from a randomised control trial where all functional outcomes except gait improved, and describe changes in gait aid use.

### Design:

Randomised control trial

### Methods:

Clients in two subacute hospital rehabilitation units were individually randomised to usual care or an intervention using interactive, motion-capture software. In addition to usual functional retraining, participants had targeted individualised programs for up to an hour, on week days, for 8 to forty sessions. Pre-post between group differences were analysed for balance, upper limb and gait outcomes. Participants unable to complete the tasks were removed from the analysis.

### Results:

Seventy-three clients after stroke (mean 22.1 days) attended mean fourteen sessions. Both groups showed statistically significant improvements in all measures except for comfortable [mean = -4.7 seconds (95% CI -10.1 to 0.5), p=0.8] or fast [mean = -2.8 seconds (95% CI -8.2 to 2.7), p=0.3] 10 metre walking time. Thirty-nine clients changed gait aids pre-post. Thirty-seven were positive gait aid progressions, with six having a slower associated time on discharge. The two that changed to more supportive gait aids on discharge had a faster time. No between group differences were seen.

### Conclusions:

The results demonstrate that measuring gait speed alone may not give an accurate representation of functional improvement particularly for clients who change gait aids or levels of independence.

### Key Practice Points:

- Measuring gait speed without including a measure of change of gait aid misrepresents functional improvement after rehabilitation.
- The inclusion of a functional ambulation classification may avoid this issue.

## MOVING OUT TO MOVE ON UP: ACADEMICS GOING RURAL TO INCREASE STUDENT PLACEMENTS

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### Aim:

To evaluate the effect of the development of the University of Newcastle Department of Rural Health's (UONDRH) physiotherapy academic roles on the number of clinical placement offers and student satisfaction at three additional UONDRH sites.

### Design:

The number of students studying physiotherapy continues to rise, as does the number of required clinical placements. In an attempt to increase placements the UONDRH developed three physiotherapy academic positions, in the rural areas of Port Macquarie, Coffs Harbour and Armidale. It was hypothesised that this additional support would encourage a greater number of clinicians to engage in clinical education and contribute to an increase in placement opportunities for students in rural and regional NSW.

### Method:

The number of physiotherapy clinical placement offers across the three sites in 2016 were compared to offers in 2017. Students completed post-placement evaluations, which were thematically analysed.

**Results:**

Student placement offers increased by 41% from 2016 to 2017. Students reported that they felt well supported during these placements, and felt prepared for rural practice through a diverse placement experience.

**Conclusion:**

Development of physiotherapy academic roles has contributed to an increased placement capacity in rural and regional areas of NSW. Student placement satisfaction supports the continuation of this initiative. Longer term evaluation of the initiative is required and the clinician's perspective also needs to be explored.

## **MUSCLE TONE MEASURES FOR CHILDREN AGED 0 TO 12 YEARS: A SYSTEMATIC REVIEW**

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**Aim:**

To systematically identify sound psychometric muscle tone measures for children aged 0-12 years

**Design:**

Systematic review

**Methods:**

Four electronic databases were searched using terms for muscle tone, assessment, children and psychometric factors. The COnsensus-based Standards for the selection of Measurement INstruments (COSMIN) Checklist was used to rate quality of studies and establish a level of evidence for each measure.

**Results:**

Twenty one measures were identified from 96 papers. All the identified measures partly included muscle tone assessment. Most measures (16/21) were designed for young children (<2 years). Measures included 26 resting tone items and 18 active tone items. Few studies provided moderate or strong evidence of validity (10/42) or reliability (3/25). Four measures were identified to assess both resting and active tone dimensions and have at least moderate evidence for validity or reliability. These are the Amiel-Tison Neurological Assessment at Term (ATNAT), Neonatal Intensive Care Unit Network Neurobehavioral Scale (NNNS), Premie-Neuro, and Hammersmith Infant Neurological Examination (HINE). These four measures are all for children <2 years. For older children, only the Neurological Sensory Motor Developmental Assessment (NSMDA) included resting and active tone items, but further reliability work is needed.

**Conclusions/ Key Practice Points:**

The ATNAT, NNNS, and Premie-Neuro can be recommended for newborn infants and the HINE for infants/children between 1 month and 2 years. For children older than 2 years, the NSMDA approaches recommendable criteria. Further research is required to improve psychometric data for current assessments and to develop and test a muscle tone specific assessment for children.

## **MUSCULOSKELETAL AND SPORTS PHYSIOTHERAPISTS' KNOWLEDGE OF PELVIC ORGAN PROLAPSE IN AUSTRALIA - A PILOT SURVEY**

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<sup>1</sup>*Charles Sturt University, Orange, Australia*, <sup>2</sup>*University of Canberra, Canberra, Australia*

**Aim:**

To examine musculoskeletal and sports physiotherapists' knowledge of pelvic organ prolapse in Australia

**Design:**

An online survey was developed with Survey Monkey to explore the knowledge of pelvic organ prolapse in Australian musculoskeletal and sports physiotherapists

**Method:**

The survey consisted of 18 questions and was distributed through social media sites.

#### Results:

There were only 16 responses. The majority of respondents are unsure how many women they manage have pelvic organ prolapse, although as one response notes “over 40% women have a prolapse and as physiotherapists prescribe exercises, it is important to know which client has reduced pelvic organ support.” Few respondents directly ask about pelvic organ prolapse symptoms in those clients with lumbopelvic, hip and groin dysfunction. Most responses indicated they had very little knowledge of pelvic organ prolapse, especially those in the athletic population and those women who are lifting heavy weights.

#### Conclusion/Key Practice Points:

- Further research is needed to explore physiotherapist’s knowledge, identification of symptoms and management of women with pelvic organ prolapse within all area of physiotherapy
- Further education is needed for all physiotherapists in the identification of symptoms, risk factors and the assessment and management of pelvic organ prolapse.

### NEED FOR AN EXTENDED HOURS PHYSIOTHERAPY SERVICE IN THE INTENSIVE CARE UNIT AT A MAJOR TRAUMA HOSPITAL: AN OBSERVATIONAL STUDY

**Jenvey O<sup>1</sup>**

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#### Aim:

To determine the need for an extended hours physiotherapy service to Intensive Care Unit patients after 4pm on weekdays.

#### Design:

A prospective longitudinal observational study at a major tertiary trauma hospital.

#### Method:

All Intensive Care Unit patients were screened on weekdays, excluding public holidays from May to August 2016. All patients in the unit were assessed at 4pm by senior physiotherapy staff to identify those who would be appropriate for cardiorespiratory physiotherapy intervention that evening to prevent deterioration in respiratory status. Data were collected regarding patient diagnosis, extubation status and recommended physiotherapy intervention.

#### Results:

From 1535 possible patient episodes, 72 (4.7%) were assessed as warranting an extended hours physiotherapy treatment. This equated to 1.14 physiotherapy episodes per day (range of 1-5). The most common patient diagnostic category for evening review was chest trauma. This was evident for both number of total patients n= 12 (26%) and number of total episodes n=21 (29%). A combined respiratory and mobility intervention for non-intubated patients was the most recommended for n=30 (42.9%) episodes. The number of patients warranting treatment on the day of extubation was n=27 (38.6%), of these nine suffered chest trauma (33.3%).

#### Conclusion/ Key Practice Points:

- There was an identified need for 1.14 physiotherapy episodes per day outside of standard hours
- Patients with chest trauma accounted for 29% of these episodes
- These findings support an extended hours physiotherapy service in the Intensive Care Unit

### NEUROLOGICAL REHABILITATION AFTER SPINAL FRACTURE IN AN ELITE FLYBALL DOG

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Background: A member of the first flyball team in Australia to run under 17 seconds was catastrophically injured whilst playing after the end of a successful interstate competition. He had spinal decompression surgery by a specialist veterinary surgeon within 24 hours of injury, but his prognosis remained guarded with limited motor return and continued incontinence post-operatively.

#### Aims / Objectives:

The aim of presenting this case study is to describe the variety of techniques used in the neurological rehabilitation of this dog.

#### Approach:

The presenter will use photographs and videos to describe physiotherapy techniques that can be used in the neurological rehabilitation of cases similar to this.

#### Conclusion / Key Practice Points: Participants will have an awareness of:

- The innervation of the bladder and control of micturition in cats and dogs;
- Signs of upper motor neuron and lower motor neuron bladder dysfunction in small animals;
- Advanced physiotherapy techniques to treat severe paraplegia, including class IV laser, walking frame gait training, whole body vibration, underwater treadmill and hyperbaric oxygen.

### NO, IT'S NOT IN YOUR HEAD! – ESTABLISHING A DEDICATED PHYSIOTHERAPY SERVICE FOR PEOPLE WITH FUNCTIONAL NEUROLOGICAL DISORDER

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<sup>1</sup>Active Rehabilitation Physiotherapy, South Brisbane, Australia

#### Aim:

Functional Neurological Disorder is common, costly and poorly diagnosed. A holistic approach is needed to manage its multifactorial nature. The primary aim of this audit was to determine whether a three month outpatient physiotherapy service, within a multidisciplinary clinic, facilitated positive patient outcomes.

#### Design:

A retrospective audit of outpatients with functional neurological disorders was undertaken. Barriers and enablers to service delivery and optimised patient outcomes were analysed. Patient outcomes were defined as positive, neutral and negative based on identified criteria.

#### Method:

All 47 patients (51% of total clinic patients) referred to physiotherapy, and receiving only outpatient intervention, were included over an 18 month period. Using descriptive statistics, patient throughput and clinical audit results were analysed.

#### Results:

51.2% of patients were seen within the proposed timeframe. Mean treatment duration was seven sessions over 14 weeks. The “did-not-attend” rate was 8%. 67% of patients audited were determined as achieving positive outcomes, 18% as neutral and 15% as having a negative outcome. The identified barriers for managing patients successfully, within this model of care, were poor patient understanding of their diagnosis, extensive psychiatric illness, stretched waitlists for other disciplines and poor understanding of the management of functional neurological disorders in external services to be able to refer onwards. Enabling factors for positive patient outcomes include access to neuropsychology and physiotherapy promoting patient-centred goals regarding self-management.

#### Conclusion:

Physiotherapy has a key role in the management of functional neurological disorders. Positive patient outcomes can be achieved through a time limited outpatient physiotherapy program.

### PATIENT LED GOAL SETTING IS EFFECTIVE IN CHRONIC LOW BACK PAIN

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#### Introduction:

The prevalence of chronic low back pain (CLBP) is estimated to be 20% and the cost is calculated to be up to 1 billion per annum. Patient led goal setting has been shown to be effective in numerous chronic conditions, however it has not been investigated in CLBP. The aim of this study was to establish the difference in clinical effectiveness and costs of a patient led goal setting intervention compared with usual care in CLBP.

#### Methods: Design:

Assessor-blinded prospective randomized controlled trial with 2 arms (1) patient led goal setting (PLGS), (2) usual care. Intervention: Participants experiencing CLBP (N=75) were randomly allocated to one of two study arms (PLGS N=37, usual care N=38). The PLGS group were involved in a patient-led goal-setting intervention, facilitated by a physiotherapist over a 2 month period. Participants assigned to the usual care group were asked to continue with their normal routine of back care.

#### Outcome measures:

Primary outcome measures of disability and pain intensity were measured at pre-treatment, post treatment (2 months), 4 and 12 months. Secondary measures of quality of life, self-efficacy and fear of movement were also taken.

#### Results:

The PLGS group improved significantly more ( $P<0.05$ ) than the usual care group in all measures from pre to post and these changes were maintained up to 12 months.

#### Conclusion:

Our findings confirm that a patient led goal-setting intervention is an effective intervention for the management of chronic low back pain showing significant improvements in all measures.

### PERCEPTIONS OF CLINICIANS IMPLEMENTING INTERACTIVE, MOTION-CAPTURE BASED REHABILITATION IN AN INPATIENT STROKE POPULATION

Bird M<sup>1</sup>, **Cannell J**<sup>1,2</sup>, Callisaya M<sup>3</sup>, Rathjen A<sup>1,2</sup>, Jovic E<sup>1,2</sup>, Lane K<sup>1,2</sup>, Elmer S<sup>1</sup>

<sup>1</sup>University of Tasmania, Launceston, Australia, <sup>2</sup>Tasmanian Health Services, Launceston, Australia,

<sup>3</sup>Menzies Institute for Medical Research, Hobart, Australia

#### Aim:

To explore clinician's perception and role, in developing an interactive motion-capture based rehabilitation system, the implementation process, and the impacts of the system on clinical practice.

#### Design:

Thematic analysis of focus groups.

#### Method:

Focus groups with semi-structured interviews using an external moderator were completed with ten clinicians (physiotherapists, occupational therapists and rehabilitation assistants). These clinicians were all involved with implementing interactive motion-capture controlled rehabilitation within a randomised control trial for stroke survivors on 2 rehabilitation units. The interviews were recorded, transcribed and thematic analysis completed.

#### Results:

Four themes were identified: Interactions with software developers, impact of new technology on practice, benefits for the clients, and adoption of new technology.

#### Conclusions:

Support from the developers, information technology staff and senior clinical staff were required for successful implementation. This innovative technology can be a vehicle for innovative change. The use of technology in practice is engaging and rewarding for both the clinicians and the clients. IT department policy limits the uptake and dissemination of this new technology.

#### Key Practice Points:

- There can be significant challenges in setting up new technologies.
- Collaboration with software developers led to the creation of very customisable programs.
- Motion-capture technology is engaging and rewarding for clients and staff.

## PLAGIOCEPHALY AND DEVELOPMENTAL DELAY: A SYSTEMATIC REVIEW

**Lucas B<sup>1,2,3</sup>**, Vujovich-Dunn C<sup>4,5</sup>, Park M<sup>6</sup>, Yu W<sup>7</sup>, Martiniuk A<sup>1,4,5</sup>

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### Aim:

To explore the association between plagiocephaly (includes plagiocephaly and brachycephaly) and developmental delay by rigorous review of published literature to guide clinical practice.

### Design:

A systematic review summary of observational studies between 1946 to Feb 2016.

### Method:

MEDLINE, EMBASE, CINAHL, and PEDro databases were searched. Data from relevant studies were extracted regarding study: sample, follow-up, design, and findings. Methodological quality of each study was rated using a critical appraisal tool.

### Results:

The search recovered 1315 articles of which 19 met the inclusion criteria. In the included studies, the children's ages ranged from 3 months to 10 years. Study limitations included selection bias, non-blinding of assessors, and reuse of the same study population for multiple papers. Most papers (11/19) rated "moderate" on methodological quality. A positive association between plagiocephaly and developmental delay was reported in 13 of 19 studies, including 4 of 5 studies with "strong" methodological quality. Delay was more frequently reported in studies with children  $\leq 24$  months of age (9/12 studies) compared with  $>24$  months of age (3/7 studies). Motor delay was the most commonly affected domain reported in high-quality papers (5/5 studies).

### Conclusion/Key Practice Points:

- This review suggests plagiocephaly is a marker of elevated risk of developmental delays.
- Clinicians should closely monitor infants with plagiocephaly for this.
- Prompt referral to early intervention services such as physiotherapy may ameliorate motor delays and identify infants with longer term developmental needs.

## PREPARING FOR INTER-PROFESSIONAL PRACTICE: SUPPORTING STUDENTS IN A CHALLENGING INTERNATIONAL, INTER-PROFESSIONAL WORKPLACE LEARNING EXPERIENCE – THE VIETNAM PROGRAM.

**Skinner K<sup>1</sup>**, Robson K<sup>2</sup>

<sup>1</sup>Charles Sturt University, Orange, Australia, <sup>2</sup>Charles Sturt University, Albury, Australia

### Aim:

A key issue for workplace learning in health professions is how to provide undergraduates with meaningful inter-professional workplace experiences, in order to produce graduates who are prepared for inter-professional practice. The aim of this study was to explore, refine and describe the components required to successfully prepare and support students to develop their inter-professional skills in a challenging international workplace learning experience.

### Design:

A qualitative, iterative reflective cycle was used to review the inter-professional Vietnam placement over a 4 year period. The process, involving university staff, partner organization therapists and participating students, included informal feedback, surveys and focus groups.

#### Results:

Components identified as integral to successful preparation and support of students included: understanding the challenges of inter-professional learning and students' different starting points in this process; and developing concrete strategies, based on previous student experiences, to prepare students for inter-professional learning opportunities. Strategies included: dedicating time during the pre-departure workshop to focus on navigating the challenges of inter-professional practice; use of experienced clinical educators, familiar with the complexities of inter-professional approaches, and able to model negotiation and conflict management; and the use of a formalized 3 year staffing and reflective cycle to enable refinement of the process.

#### Conclusion/Key Practice Points:

- Inter-professional learning doesn't necessarily lead smoothly to inter-professional practice
- One key to success of an inter-professional learning experience is our ability to prepare students for the challenges they will face around these issues
- Components for success include preparation activities, role models and a formalized, reflective cycle.

### PREVALENCE OF PAIN IN PEOPLE WITH CHRONIC ANKLE INSTABILITY

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<sup>1</sup>*Faculty of Health Sciences, University Of Sydney, Sydney, Australia*

#### Aim:

To identify the prevalence of pain in people with chronic ankle instability and whether pain correlates with other impairments of chronic ankle instability.

#### Design:

Systematic Review

#### Methods:

The databases of MEDLINE, CINAHL, AMED, Scopus, SPORTDiscus, EMBASE, Web of Science and PubMed were searched from the earliest records until March, 2017. Eligible studies were peer-reviewed studies that reported the presence of ankle pain, or investigated the effect of pain on impairments in people with chronic ankle instability. Surgical interventions were excluded and there were no age or language restrictions. Studies identified by the search strategy were screened against the eligibility criteria and data was extracted by two independent reviewers.

#### Results:

Fifteen studies were included in this review. All studies assessed pain by one of two methods; self-report questionnaires and/or ankle physical examination. Pain was self-reported in 25%-79% of participants and 4.5-75% on physical examination, depending on the test applied. Among these studies, the highest reported level of pain was 4.9 on the visual analogue scale. None of the included studies investigated the relationship between pain and chronic ankle instability impairments.

#### Conclusion/ Key Practice Points:

- Pain was present in a surprisingly high proportion of people who had chronic ankle instability, although the pain level was low.
- Information about the impact of pain was not reported.
- Future studies should investigate the association between pain and function, balance or other activities in people with chronic ankle instability.

## PROFILING THE GENERAL MEDICINE PHYSIOTHERAPY SERVICE DELIVERY MODELS ACROSS MAJOR ACUTE METROPOLITAN HOSPITALS WITHIN AUSTRALIA

**Davies H<sup>1</sup>, Granger C<sup>1</sup>**

<sup>1</sup>Melbourne Health, Melbourne, Australia

### Aim:

To investigate physiotherapy service delivery for General Medicine in major acute Australian hospitals and their staff satisfaction.

### Design:

Online survey

### Method:

Australian metropolitan hospitals with a General Medical Unit were eligible to participate. Physiotherapy managers from 51 hospitals were approached. The 40-item survey included questions about physiotherapy EFT/case mix, perceived service delivery model adequacy and staff satisfaction. Data are reported as mean  $\pm$  standard deviation (SD) or median [interquartile range IQR].

### Results:

Forty two out of 51 hospitals were contactable and 28 (67%) completed the survey. Number of beds allocated to General Medical patients was  $89 \pm 54$ , with 86% of respondents reporting a designated General Medical ward. The general medicine physiotherapy EFT was  $3.4 \pm 1.8$  per hospital and grade one (junior) was the most common classification.

33% of respondents perceived they had 'inadequate' staffing and therapists noted increases in caseload without associated increases in physiotherapy staffing. Physiotherapists' caseloads were 15 [14 - 18] patients/day; and they routinely provided treatment to  $11 \pm 2.5$  patients/day. There was a moderate relationship between an increased number of patients seen daily with increased number of hospital beds ( $\rho = 0.534$ ,  $p = 0.01$ ). 100% of respondents reported seasonal increases in workload but only 2 sites (7%) reported associated increased seasonal physiotherapy EFT. 78% of therapists felt satisfied with their job.

### Conclusion/Key Practice Points:

- We have reported the profile of acute physiotherapy service delivery in general medicine and results can be used by other hospitals to benchmark.
- Further work is required to determine the optimal physiotherapy model for patient outcomes.

## PROTOCOL FOR A FEASIBILITY STUDY: COMPARING MODELS OF PHYSIOTHERAPY SERVICE DELIVERY IN PARKINSON'S DISEASE

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<sup>1</sup>University of Sydney, Sydney, Australia, <sup>2</sup>University of Canberra, Bruce, Australia

### Aim:

To investigate in people with Parkinson's disease: i) the feasibility of a remotely monitored home-based physiotherapy program compared to a predominantly group-based program, and ii) the effect of the programs on balance and mobility.

### Design:

A randomised feasibility trial, with concealed allocation, blinded assessment and intention-to-treat analysis.

### Method:

Forty participants with idiopathic Parkinson's disease will complete a physiotherapy program three times per week for 10 weeks. For the first five weeks, all participants will complete a predominately group-based program, in conjunction with a self-management program. For the second five weeks participants will either continue in the predominantly group-based program or change to a remotely monitored home-based program, supported by the PhysioTherapy eXercises app (physiotherapyexercises.com).

### Outcome measures:

The primary outcome measure will be the feasibility of the recruitment and intervention. Secondary outcome measures will be walking speed (preferred and fast) and balance (miniBEST test). Feasibility of the trial will be

determined using descriptive statistics and reported as mean (SD) and number (%). Between group differences will be analysed using linear regression.

**Conclusion/Key Practice Points:**

- This study aims to help people with Parkinson's disease live well over the course of their disease by exploring models of care designed to provide sustainable and effective physiotherapy.
- If remotely monitored home-based physiotherapy is feasible and effective for people with Parkinson's disease, then a service delivery model which includes alternating periods of group-based and home-based physiotherapy could substantially increase access to resource efficient and effective physiotherapy for people with Parkinson's disease.

Trial Registration: ACTRN12617000503325

## PSYCHOMETRIC STUDY ON SEGMENTAL ASSESSMENT OF TRUNK CONTROL IN INFANTS FROM 4 TO 9 MONTHS OF AGE

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<sup>1</sup>The Hong Kong Polytechnic University, Hung Hom, Hong Kong, <sup>2</sup>Manchester Metropolitan University, , United Kingdom, <sup>3</sup>Prince of Wales Hospital, Shatin, Hong Kong

**Aim:**

To examine the reliability, validity and responsiveness of the Segmental Assessment of Trunk Control in young infants.

**Design:**

Longitudinal study

**Method:**

With two examiners, full-term and preterm infants born  $\leq 30$  weeks of gestation were scored using the Segmental Assessment of Trunk Control monthly from four to nine months (corrected for preterm infants). At four and eight months, the infants were scored using the Alberta Infant Motor Scale.

**Results:**

Twenty full-term (gestation = 38.7 weeks; birthweight = 3019.9 g) and 20 preterm infants (gestation = 27.2 weeks; birthweight = 989.6 g) were recruited. The inter and intra-rater reliability of the trunk control levels on the full-term infants was fair to very good (Kappa = 0.35-1.0) and good to very good (Kappa = 0.69-0.85) respectively. At 8 months, the reactive trunk control levels were significantly correlated with the sit and stand sub-scores, and total score of the full-term infants (Spearman's rank = 0.45 to 0.54). The preterm infants scored significantly lower in the reactive trunk control than the full-term infants at eight months (Mann Whitney,  $p = 0.022$ ). A significant developmental trend was shown in the static, active and reactive trunk control of the full-term infants (Chi-square,  $p < 0.001$ ).

**Conclusion/ Key Practice Points:**

- The Segmental Assessment of Trunk Control was reliable, valid and responsive in assessing trunk control in young infants.
- The segmental trunk control was correlated with the motor skills in upright positions and could differentiate the reactive trunk control between the preterm and full-term infants at 8 months.

## RECOVERY OF HUMAN ACHILLES TENDON THREE-DIMENSIONAL DEFORMATION FOLLOWING CONDITIONING

**Nuri L<sup>1</sup>**, Obst S<sup>1</sup>, Newsham-West R<sup>1</sup>, Barrett R<sup>1</sup>

<sup>1</sup>School of Allied Health Sciences, Menzies Health Institute Queensland, Griffith University, Gold Coast, Australia

**Aim:**

The nature and time course of recovery following tendon conditioning has implications for the design of experiments that measure tendon mechanical properties, but could also provide information about the viscoelastic properties of tendon that underpin tendon function, adaptation and injury prevention. The present

study investigated the time course of recovery of three dimensional Achilles tendon (AT) deformation following a standardized AT conditioning protocol.

Design:  
Cross-sectional study

Method:  
Ten healthy male adults attended the laboratory on 6 occasions. ATs were scanned using freehand three-dimensional ultrasound during a 50% MVIC of the plantarflexors immediately prior to conditioning and at one of 6 time points following conditioning at each session (0, 15, 30, 60, 90, and 120 minutes).

Results:  
The conditioning protocol resulted in increase in whole and free AT longitudinal strain and free AT transverse strain. The free AT longitudinal and transverse strain did not differ from 0 min post-conditioning values at up to 60 and 30 minutes respectively and returned to pre-conditioned strain values after 2 hours. However, whole AT experienced significantly greater strain than pre-conditioning and 0 min post-conditioning values up to and including 2 hours.

Conclusion/Key Practice Points:

- Recovery was therefore interpreted to be complete for the free AT in both longitudinal and transverse dimensions and incomplete for the whole AT at 2 hours post-conditioning.
- Further, the time windows in which free AT longitudinal and transverse strains could be achieved without a large confounding effect of creep recovery are approximately 60 and 30 minutes respectively

## REFLECTING ON OUR FIRST STEPS: INTEGRATING INDIGENOUS AUSTRALIAN CONTENT ACROSS A PHYSIOTHERAPY DEGREE.

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<sup>1</sup>Charles Sturt University, Orange, Australia, <sup>2</sup>Charles Sturt University, Albury, Australia, <sup>3</sup>Charles Sturt University, Bathurst, Australia

Aim:  
To review and reflect on the processes used at a university level to integrate Indigenous Australian content into a Physiotherapy degree.

Design:  
A qualitative, iterative reflective cycle was used to review processes used, challenges identified and outcomes achieved.

Method:  
A university-wide course design, implementation and course performance process was used to review the physiotherapy course. As part of this process, Indigenous and non-Indigenous academics formed partnerships to integrate Indigenous content in subjects across the degree with the aim of transforming practice and supporting staff and students on their cultural competency journey. The effectiveness of this process, and lessons learnt, were reviewed by an inter-disciplinary team of academics.

Results:  
This process identified where the integration and assessment of graduate cultural capabilities – respect, communication, safety and quality, reflection, and advocacy - will occur across the physiotherapy course. Effective implementation requires changes to underlying models of practice and teaching approaches across the entire curriculum. Racism, invisible whiteness, decolonisation, and cultural competence are central conversations necessary to enable development and implementation of physiotherapy specific Indigenous curricula, facilitated through education and culturally competent leadership. There were challenges inherent in this process, requiring a willingness of stakeholders to participate in difficult conversations in order to move forward.

Key Practice Points:

- A university level, structured process is needed to integrate Indigenous content across physiotherapy degrees.
- Respectful and successful integration of Indigenous content requires a willingness of parties to actively participate in difficult conversations.
- Critical self-evaluation and reflexivity by academics is key.

## RELATIONSHIP AMONG ECCENTRIC HIP AND KNEE MUSCLE STRENGTH WITH PAIN AND SELF-REPORTED FUNCTION IN FEMALES WITH PATELLOFEMORAL PAIN

**Ferreira A<sup>1,2</sup>**, De Oliveira Silva D<sup>1,3</sup>, Pazzinatto M<sup>1</sup>, Ferrari D<sup>1</sup>, Briani R<sup>1</sup>, Azevedo F<sup>1</sup>

<sup>1</sup>São Paulo State University (UNESP), Presidente Prudente, Brazil, <sup>2</sup>The University of Sydney, Sydney, Australia, <sup>3</sup>La Trobe University, Melbourne, Australia

### Aim:

To determine the relationships among eccentric hip and knee strength, self-reported function and pain in females with patellofemoral pain (PFP).

### Design:

Within-subject correlational study.

### Method:

Thirty females with PFP aged 18 to 30 years old were included. Eccentric strength of the hip abductors, lateral rotators, and knee extensors were assessed using an isokinetic dynamometer. Self-reported function was assessed by the Anterior Knee Pain Scale (AKPS). Then, participant's usual knee pain in the last month was assessed by a 100-mm visual analog scale.

### Results:

No significant relationships were found among eccentric hip abductor strength with the AKPS score ( $r = 0.12$ ;  $p = 0.50$ ) and usual pain during the last month ( $r = 0.22$ ;  $p = 0.24$ ). Similarly, the eccentric hip lateral rotator strength was not correlated with the AKPS score ( $r = -0.25$ ;  $p = 0.18$ ) and pain ( $r = 0.23$ ;  $p = 0.11$ ). Moreover, no significant relationships were found between eccentric knee extensor strength and the AKPS score ( $r = -0.01$ ;  $p = 0.93$ ) and pain ( $r = -0.14$ ;  $p = 0.45$ ).

### Conclusion/ Key Practice Points:

- Findings indicate that eccentric hip and knee strength are not associated with the self-reported function and pain in females with PFP.
- In this direction, interventions should not be focused just in muscle strength. It is important to emphasize that muscle strength represents just one aspect of muscle function, with other aspects of neuromuscular function possibly also being affected by, or leading to, deficits in functional capacity and pain in females with PFP.

## RELATIONSHIP BETWEEN PERFORMANCE ON SHOULDER MOBILITY TESTS AND INJURY IN STATE-LEVEL WATER POLO PLAYERS.

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<sup>1</sup>Research Institute for Sport and Exercise - University of Canberra, Bruce, Australia, <sup>2</sup>Centre of Excellence - Queensland Academy of Sport, Brisbane, Australia, <sup>3</sup>Allied Health School - Griffith University, Gold Coast, Australia, <sup>4</sup>Menzies Health Institute Queensland - Griffith University, Gold Coast, Australia

### Aim:

To evaluate 3-year data on shoulder range of motion values (internal and external rotation) and the relationship between range and shoulder injury in state-level water polo players

### Design:

Retrospective cohort study.

### Method:

Data from 2014 to 2016 from 23 state water polo athletes (Male/Female = 10/13) were available for analysis. Values for shoulder internal and external rotation range of motion and episodes of shoulder injury were recorded by the same team physiotherapist over the 3-year period.

#### Results:

There was significantly greater external rotation range ( $105.14 \pm 14.24$  vs  $96.96 \pm 10.05$ ,  $p < 0.001$ ) and corresponding reduction in internal rotation ( $45.49 \pm 13.2$  vs  $56.20 \pm 11.45$ ,  $p < 0.001$ ) in the preferred vs non-preferred throwing arm. There was no significant difference in total range ( $150.77 \pm 19.1$  vs  $153.03 \pm 13.54$ ,  $p = 0.27$ ).

Over the 3-year period, 133 injuries were recorded, including 21 shoulder injuries. Of these, 14 involved the preferred throwing arm. In the year preceding injury, there was a significant reduction in external rotation range ( $97.22 \pm 21.67$ ) which had returned to baseline values at the following annual screening ( $107.78 \pm 13.94$ ,  $p = 0.023$ ). There was however no significant difference in external rotation range between players that developed shoulder injury ( $97.22 \pm 21.26$ ) and players who did not ( $105.89 \pm 12.75$ ,  $p = 0.089$ ).

#### Conclusion/Key Practice Points:

- Water polo athletes' demonstrate an adaptive increase in external rotation range in the preferred throwing arm.
- Although external rotation range did not reach statistical significance for injury risk, throwing shoulder external rotation should be monitored, and a range of greater than 100 degree is recommended.

### RELATIONSHIPS BETWEEN BRAIN BIOCHEMISTRY AND NECK KINEMATICS IN INDIVIDUALS WITH CHRONIC IDIOPATHIC NECK PAIN

**Snodgrass S<sup>1,2,3</sup>**, Stanwell P<sup>2,3</sup>, Edwards S<sup>4</sup>, Moghaddas D<sup>1</sup>, Blyton S<sup>1</sup>, Cooper R<sup>1</sup>, de Zoete R<sup>1,2,3</sup>, Oldmeadow C<sup>3</sup>, Rivett D<sup>1,2,3</sup>

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#### Aim:

To determine associations between cerebral biochemistry and neck kinematics in chronic neck pain.

#### Design:

Observational cohort.

#### Method:

Cerebral biochemistry and three-dimensional kinematics were measured in 18 individuals with chronic idiopathic neck pain (> 3 months duration and numerical pain rating scale  $\geq 4/10$ ). Magnetic resonance spectroscopy quantified cerebral metabolites in the motor cortex and thalami (pre-motor) including N-acetylaspartate (NAA, neuronal marker), and total creatine (tCr, marker of cellular energy stores). Kinematic variables during overhead reach and putting on a seatbelt included maximum joint angle, time to maximum, total range of motion, and velocity for head segment relative to neck (HN) and head/neck segment relative to thoracic (HNT). Associations between cerebral metabolites and kinematic variables were examined with Pearson's correlations.

#### Results:

Significant correlations included greater HN extension ROM during the seatbelt task associated with lower thalamic NAA ( $r = -.639$ ,  $p = .008$ ), suggesting reduced or dysfunctional neurons in the thalamus were a marker of increased neck extension (i.e., greater forward head posture) during the functional task. Delayed timing of maximum rotation during reach was associated with lower motor cortex NAA/tCr ratio (HNT:  $r = -.515$ ,  $p = .034$ ), suggesting reduced or dysfunctional neurons in the motor cortex were associated with delayed timing of attaining maximum rotation during reach.

#### Conclusion/Key Practice Points:

- Neck kinematics are associated with brain biochemistry in individuals with idiopathic neck pain suggesting their neck movement is affected by altered central control
- These data provide evidence for a central mechanism influencing the cervical movement patterns clinicians observe.

## RESPONDING TO THE BURDEN OF HIP AND KNEE OSTEOARTHRITIS IN VICTORIA, AUSTRALIA: DEVELOPMENT OF A SYSTEM-WIDE MODEL OF CARE

**Page C<sup>1</sup>**, Briggs A<sup>1,2</sup>, Shaw B<sup>1,3</sup>, Bendrups A<sup>4</sup>, Cary B, Philip K<sup>5</sup>, Buckley T<sup>5</sup>, Choong P<sup>1,6,7</sup>

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### Aim:

Current projections predict a substantial rise in the prevalence of osteoarthritis, which will create significant downstream consequences for the workforce, health services, labour force participation, and population health. Models of Care provide a framework to address a multi-level health problem.

### Method:

The Victorian Department of Health and Human Services sponsored the developed of a Model of Care for hip and knee osteoarthritis. The Model of Care was developed following a multi-phase consultative approach: broad, cross-sector consultation around current OA health service issues in Victoria, establishment of an interprofessional external advisory group to iteratively develop and review the Model of Care; consumer consultation; broad, cross-sector consultation on a draft Model of Care; further revision and final consultation.

### Result:

The Model of Care describes assessment and key components of care for osteoarthritis, including: non-pharmacologic and non-surgical care; pharmacologic care; and total joint replacement surgery. Knee arthroscopy and the routine use of magnetic resonance imaging are not recommended. Enablers to appropriate care include: building peoples' capacity to more effectively participate in care; implementation of novel models of health service delivery and workforce efficiency such as advanced scope roles for allied health providers; use of information and communication technologies; and ensuring osteoarthritis care is explicit within emerging health policy and planning. In broad consultation (phase 3), 64-92% of stakeholders supported the various components of the MoC. The MoC is publicly supported by peak organisations.

### Conclusion:

The MoC provides a framework for OA service planning and care delivery in Victoria.

## RETRAINING OF BLADDER FUNCTION IN A PARAPLEGIC CAT

**Nicholson H<sup>1</sup>**

<sup>1</sup>Whole Family Health, St Marys, Australia

### Background:

A six-month-old stray kitten had been shot in the spine by an unknown assailant and was taken by a good Samaritan for veterinary care. Spinal surgery to remove the bullet fragments was conducted by a specialist veterinary surgeon, but the kitten did not regain ambulatory or bladder function post-operatively. The lady who adopted her took her to her local vet twice daily for bladder expression for many months whilst also performing a daily physiotherapy home exercise program to assist with retraining bladder function.

### Aims / Objectives:

This case study will provide participants with plan of attack to retrain bladder function in incontinent cats and dogs.

### Approach:

The presenter will use visual aids to describe the physiotherapy techniques used to retrain bladder function in incontinent small animals. Similar cases, including those with degenerative myelopathy and spay incontinence, will also be discussed.

### Conclusion / Key Practice Points: Participants will have an awareness of:

- The innervation of the bladder and control of micturition in cats and dogs;
- Signs of upper motor neuron and lower motor neuron bladder dysfunction in small animals;
- The application of physiotherapy techniques, including the use of whole body vibration, to retrain bladder function in cats and dogs.

## RISK OF RECURRENCE OF LOW BACK PAIN: A SYSTEMATIC REVIEW

**da Silva T<sup>1</sup>**, Mills K<sup>1</sup>, Brown B<sup>2</sup>, Herbert R<sup>3</sup>, Maher C<sup>4</sup>, Hancock M<sup>1</sup>

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### Aim:

To investigate the risk and prognostic factors, of a recurrence of low back pain, in patients who have recovered from a previous episode of low back pain within the last year.

### Design:

Systematic Review.

### Method:

Systematic searches were conducted in the of MEDLINE, Embase, and CINAHL databases. We included longitudinal studies of adults who had recovered from a previous episode of low back pain within 12 months. The primary outcome was a new episode of low back pain. Secondary outcomes were other types of recurrence (e.g., episodes causing care seeking). We have also analysed the prognostic factors related to recurrences of low back pain.

### Results:

Eight studies were included in the review, 7 observational studies and 1 randomized trial (2 publications). Six studies reported recurrence proportions for the primary outcome of an episode of low back pain. Meta-analysis was not conducted due to the low quality (for example, lack of inception cohort studies) and heterogeneity of studies. Only 1 study was considered an inception cohort study (<6 weeks since recovering from low back pain); it reported a 1-year recurrence proportion of 33%. A history of previous episodes of low back pain prior to the most recent episode was the only factor that consistently predicted recurrence of low back pain.

### Conclusion/Key Practice Points:

- The available research does not provide robust estimates of the risk of low back pain recurrence and provides little information about factors that predict recurrence in people recently recovered from an episode of low back pain.

## SCH PAEDIATRIC PHYSIOTHERAPY TRAINING PROGRAM – A STEEP LEARNING CURVE

**Daley D<sup>1</sup>**, Grech D<sup>1</sup>

<sup>1</sup>Sydney Children's Hospital, Randwick, Australia

### Aim:

To determine the benefits of a structured 2 year paediatric physiotherapy rotation program for level 1-2 therapists and their clinical leads.

### Design:

Single group pre and post implementation questionnaire.

### Method:

Eleven level 1-2 physiotherapists were recruited to a two year rotation program between February 2011-October 2016. The program consisted of four modules which included structured learning objectives, facilitated peer group supervision and one to one supervision. Surveys were completed pre and post program.

Outcome measures: questionnaire; 5 item Likert scale; PANAS wellbeing scale

### Results:

Data was analysed from all eleven participants who completed the pre-program surveys and four who completed the post survey. PANAS wellbeing scores for positive and negative affect remained stable for all four participants who to date have completed the program (pre positive range 31-41, post positive range 38-

50, pre negative range 11-17, post negative range 10-11). Benefits of the program reported from rotators included increased self- efficacy in patient goal setting, evidence- based clinical reasoning skills, teaching others, working in teams, basic research skills and clinical skills to manage acute, community and rehabilitation caseloads. Clinical leads also reported positive impact from the program along with significant challenges including increased time spent teaching and supervising adversely impacting on their clinical caseload.

**Conclusion:**

This was the first structured rotation program for junior physiotherapists offered at Sydney Children's Hospital. Rotators reported significant benefits to their practice however the negative impact on clinical leads was deemed too high to be sustainable using this structure in a paediatric setting.

## SELF-REPORTED BARRIERS TO AND ENABLERS OF PHYSICAL ACTIVITY ONE YEAR AFTER UNILATERAL PRIMARY TOTAL KNEE REPLACEMENT: A FOCUS GROUP STUDY.

**Hodges A<sup>1</sup>**, Harmer A<sup>1</sup>, Dennis S<sup>1,2,3</sup>, Fransen M<sup>1</sup>

<sup>1</sup>University of Sydney, Lidcombe, Australia, <sup>2</sup>South Western Sydney Local Health District, Liverpool, Australia, <sup>3</sup>Ingham Institute for Applied Medical Research, Liverpool, Australia

**Aim:**

Little is known regarding determinants of uptake of physical activity among older people after total knee replacement surgery. This study aimed to identify barriers to and enablers of adequate physical activity 12 months following surgery, and investigate awareness of the World Health Organisation activity guidelines.

**Design:**

Patients (>45 years) from two private hospitals in Sydney, who had undergone a total knee replacement 12 months previously, were invited to attend a focus group conducted by two researchers.

**Method:**

Four focus groups were audio-recorded and transcribed verbatim. Theme saturation was achieved and transcriptions were coded thematically using NVivo. Themes arising were discussed with the research team and further reflective coding undertaken.

**Results:**

Twenty people (aged 54-90 years; 44% women) attended the focus groups. Most of the participants reported being physically active and attributed this to social support and self-motivation. Barriers included lack of social support, comorbidities and fear of falling. A majority of patients (90%) were unaware of the activity guidelines and wanted a long-term follow-up appointment at six or 12 months.

**Conclusion:**

Most patients were physically active, but reported that a lack of long-term targets affected their motivation for improving activity levels.

**Key Practice Points:**

- Physiotherapists are in a unique position to educate patients about the recommended WHO guidelines; and to set long-term appropriate goals that accommodate comorbidities.
- This study focused on a particular group of private patients (well-educated and motivated) and may not be representative of all patients following total knee replacement.

## SPINAL CORD STIMULATION (SCS) OF THE DORSAL ROOT GANGLION (DRG) FOR FOOT PAIN AND OTHER NEUROPATHIC PAIN CONDITIONS

**Ryan M<sup>1</sup>**

<sup>1</sup>*Metro Pain Group, Clayton, Australia*

### Aim:

Spinal cord stimulation (SCS) of the dorsal root ganglion (DRG) has been proposed as a compelling development in neuromodulation pain therapies. Our aim was to assess the outcomes of a consecutive series of real world patients treated with DRG SCS.

### Design:

We present an overview of DRG SCS technique and applications, plus outcomes for a consecutive series of foot pain patients treated with DRG SCS.

### Method:

Twenty-one consecutive foot pain patients were prospectively recruited and trialled for DRG SCS. Subjects achieving  $\geq 50\%$  pain relief proceed to a fully implanted system.

Response to treatment was assessed via pain relief, disability and emotional state. Assessments were made at baseline, end of trial (EOT), 6 and 12 months.

### Results:

Three patients failed trial (trial to permanent implant 86%). In implanted subjects mean foot pain at baseline was 7.4 (SD 1.2, n=21), which decreased significantly at 6 months to 3.18 (SD 1.6, n=11;  $p < 0.01$ ), with all but one patient maintaining  $\geq 50\%$  pain relief.

The mean baseline ODI was 48.4 (SD 1.4, n=13) representing severe disability. The mean ODI dropped at 6 months to 35.25 (SD 1.5, n=4) reflecting a drop to moderate disability.

At baseline, depression and anxiety levels were severe. At 6 months both improved: depression to moderate, anxiety to mild levels. The mean baseline stress measure was within normal range. Stress increased to mild at EOT but returned to normal at 6 months.

### Conclusions:

DRG SCS is an exciting and compelling new treatment option for chronic, non-responsive limb pain.

## SURVEY OF CARDIORESPIRATORY PHYSIOTHERAPY CLINICAL EDUCATION PLACEMENTS IN QUEENSLAND

**Schofield P<sup>1</sup>**

<sup>1</sup>*Queensland Health, Gold Coast, Australia*

### Aim:

To describe the nature of cardiorespiratory clinical placements currently offered in Queensland Public Health Services (QPHS).

### Design:

Online survey administered to all QPHS facilities that provided cardiorespiratory clinical placements in 2016.

### Method:

The survey was distributed to the cardiorespiratory clinical education coordinators at each facility. The survey's questions addressed items including the environment and supervision model for the placement, client characteristics, typical conditions and experiences gained, use of simulation and workload expectations.

### Results:

Twenty-one facilities participated. All placements were based within a hospital setting, primarily dealing with adult inpatients. The most common supervision model used involved a staff member with their own clinical load being responsible for the supervision of two students. Consistent access was reported to patients with atelectasis, COPD, pneumonia, functional decline, cognitive problems, obesity or after abdominal surgery. While exposure to ICU was common, access to other services, medical conditions or surgeries varied. A

consistent level of exposure to a range of cardiorespiratory assessments and treatment methods. However, exposure to pre-admission clinics, oropharyngeal and nasopharyngeal airway suctioning, non-invasive ventilation, sputum induction and cough augmentation techniques was infrequent. The majority (92%) of respondents expected students to achieve between 5 and 10 occasions of service per day in the final weeks of placement.

**Conclusion/Key Practice Points:**

- Despite the increase in sites offering cardiorespiratory clinical placements in QPHS, there appears to be consistent exposure to core caseloads, assessment and treatment methods.

**TARGETED TRAINING THERAPY: A CASE STUDY ILLUSTRATING THIS INNOVATIVE METHOD FOR PROMOTING HEAD CONTROL IN A CHILD WITH CEREBRAL PALSY**

**Pin T<sup>1</sup>**, Butler P<sup>2</sup>, Bew S<sup>3</sup>

<sup>1</sup>The Hong Kong Polytechnic University, Hung Hom, Hong Kong, <sup>2</sup>Manchester Metropolitan University, , United Kingdom, <sup>3</sup>The Movement Centre, , United Kingdom

**Aim:**

To explore the use of Targeted Training to promote head control and function

**Design:**

Case study

**Method:**

A girl (4 years 0 months) with dyskinetic cerebral palsy was assessed using the Segmental Assessment of Trunk Control and Gross Motor Function Measure 66 at outset and after 9 months of therapy. Specialised Targeted Training equipment with head support was used for home based therapy, reviewed and adjusted at 8 week intervals to increase range and control of head movement. The head support was removed after 6 months.

**Results:**

At outset, the child was unable to maintain a neutral head posture, compounded by contracture of the left sternocleidomastoid muscle, to floor sit without extreme trunk flexion or bench sit independently. After Targeted Training, she maintained a neutral head position with active control through all range. Her trunk flexion in floor sit was markedly reduced and she could floor and bench sit without hand support. The Segmental Assessment of Trunk Control initially identified poor Static and Active head control, improving at end to Static and Reactive learning at Upper Lumbar and Active at Lower Thoracic levels. Gross Motor Function Measure score initially was 26.66, percentile 73.0, rising at end to 35.67, percentile 94.0.

**Conclusion/ Key Practice Points:**

- The use of Targeted Training for this child resulted in dramatic gain of functional skills and elimination of muscle tightness making further functional gains a realistic possibility.
- This segmental approach to treatment is likely to have potential for many children with problems of movement control.

**THE RELATIONSHIP BETWEEN GESTATIONAL AGE AND PHYSICAL ACTIVITY IN PRESCHOOL CHILDREN**

**Hair R<sup>1,2</sup>**, Jensen L<sup>2</sup>, Downs J<sup>2,3</sup>

<sup>1</sup>Ability Centre, Canning Vale, Australia, <sup>2</sup>Curtin University, Perth, Australia, <sup>3</sup>Telethon Kids Institute, University of Western Australia, Perth, Australia

**Aim:**

To determine the relationship between gestational age and duration and intensity of physical activity in preschool children.

**Design:**

A cross sectional study of data collected January to February 2016.

#### Method:

The study involved 45 children aged four and five years (27 term, 18 preterm) who presented without neurological, musculoskeletal or cardiorespiratory conditions. Duration and intensity level of physical activity were measured for five days using the Actical® (Respironics, USA) accelerometer. A diary was completed for a 24 hour period to categorise and measure the duration of quiet and active play.

#### Results:

All children met the national guidelines for duration of daily moderate/vigorous physical activity. Increasing gestational age was associated with shorter duration ( $p = 0.16$ ) and lower intensity ( $p = 0.02$ ) of light physical activity, but increased duration ( $p = 0.37$ ) and higher intensity ( $p = 0.27$ ) of moderate/vigorous activity. Diary data reported preschool children spent a similar duration in each type of daily activity at similar times of the day, suggesting the presence of routine. Males participated in more light activity and females more moderate/vigorous activity. Those born small for gestational age spent less time in physical activity, and were more sedentary compared to those born appropriate for gestational age.

#### Conclusion:

- Preschool children met the national guidelines for daily physical activity.
- Compared to their term peers, preterm children participated in a similar duration, but lower intensity of physical activity.
- The consequences of lower intensity physical activity on cardiorespiratory health require further investigation in preterm children.

### THE RELATIONSHIP BETWEEN MOTOR SKILLS AND ACADEMIC VARIABLES IN SCHOOL-AGED CHILDREN WITH NEURODEVELOPMENTAL DISORDERS: A SYSTEMATIC REVIEW

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<sup>1</sup>*Faculty of Health Sciences and Medicine, Bond Institute of Health and Sport, Bond University, Gold Coast, Australia*

#### Aim:

This systematic review aimed to examine the relationship between motor skills and academic variables in school-aged children with neurodevelopmental disorders; specifically Autism Spectrum Disorder, Developmental Coordination Disorder, Dyslexia and Attention-Deficit-Hyperactivity Disorder.

#### Design:

Systematic review

#### Method:

A systematic search was conducted of five databases; studies were screened and extracted in accordance with the 'Preferred Reporting Items for Systematic review and Meta-Analysis' protocol. Critical appraisal and low risk of bias analysis was completed using the modified Downs and Black protocol. The 'Strengthening the Reporting of Observational studies in Epidemiology' checklist was utilised to examine data reporting quality. Finally, relationship data was extracted for synthesis.

#### Results:

Thirteen articles from 5,806 were critically reviewed. Methodological quality of the studies ranged between poor and good. Data reporting quality ranged between fair and good. Significant positive correlations were demonstrated between motor skills and cognition for children with Autism Spectrum Disorder ( $n = 7$ ) and Attention-Deficit-Hyperactivity Disorder ( $n = 109$ ). Relationships between motor skills and other academic variables cannot be confirmed due to a lack of research with high methodological quality in this field.

#### Conclusion:

Moderate-to-very-strong relationships exist between motor skills and cognitive variables for children with Attention-Deficit-Hyperactivity Disorder. Quality evidence from observational studies with robust methodology and data reporting is needed to further explore relationships between the investigated variables for children with other neurodevelopmental disorders.

#### Key Practice Points:

- Relationships exist between motor skills and cognition in children with Attention-Deficit-Hyperactivity-Disorder.
- Investigating these relationships may help inform school curriculum development for children with neurodevelopmental disorders.

#### THE USE OF ACUPUNCTURE TO COMPLEMENT MANUAL THERAPY TREATMENT TO REDUCE SYMPTOMS OF THORACOLUMBAR SPINE SPRAIN IN A GOLDEN RETRIEVER

**Prochazka L<sup>1</sup>**

<sup>1</sup>*Dogs In Motion, Moorabbin, Australia*

##### Aim:

To use a combination of manual therapy techniques and acupuncture points to treat a six year old female spayed Golden Retriever presenting with thoracolumbar spine pain and reduced mobility in her hind limbs.

##### Method:

The patient was seen by their local Vet two days after the initial incident and on examination the Vet reported significant discomfort on palpation around Thoracolumbar junction. Radiology was recommended as well as non-steroidal anti-inflammatory drugs and rest. Lateral and Dorsal/Ventral x-rays of her thoracolumbar spine revealed no significant findings.

Fortnightly acupuncture treatments and manual therapy techniques were used to successfully reduce symptoms of pain and weakness in patient's lower back and hind limbs which developed two months prior to initial treatment session. The patient was treated using a combination of Maitland UPA glides to T 13, L 1, L 2 and L 3 (left and right) facet joints, provision of a home exercise program and Acupuncture points BL11, BL 21, BL 22, BL 23, GB 34 and SP 6.

##### Results:

The patient responded quickly and very well to two treatments. Follow up call to Owner five weeks post treatment was positive and confirmed that the patient was now back to full activity and displayed no further signs of pain, weakness or reduced mobility.

##### Conclusion/Key Practice Points:

- Canine patients with thoracolumbar spine sprain and symptoms of hind limb weakness can respond quickly to using our traditional manual therapy techniques and combining them with traditional Chinese medicine acupuncture points.

#### THE USE OF AN EXPERT PANEL TO DEVELOP QUALITY INDICATORS FOR MUSCULOSKELETAL INJURIES IN THE EMERGENCY DEPARTMENT

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##### Aim:

To develop a preliminary suite of quality indicators (QIs) focussing on quality of care of musculoskeletal injuries across the clinical cycle in the Emergency Department (ED).

##### Design:

Expert panel meeting.

#### Method:

A face-to-face meeting was held over two days in 2015, comprising 15 key stakeholders involved in the care of musculoskeletal injuries in the ED (emergency medicine specialists, allied health, nursing, orthopaedic specialists, quality improvement experts and consumers). The panel followed a formal process of review, including a general discussion of the literature, a review of existing QIs with panel suggestions for modification, and a review of potential QIs which were based on a series of literature reviews. The expert panel provided input via open discussion. QIs were adjusted as required, and additional areas of quality of care were identified if needed.

#### Results:

A total of 190 QIs were included in the preliminary suite (n = 28 structure QIs, n = 137 process QIs, n = 25 outcome QIs). These were incorporated into data collection tools in order to test their validity and feasibility in a follow-up study.

#### Conclusion / Key Practice Points:

- The expert panel meeting ensured that key stakeholders provided valuable input and reviewed the QI set, which was derived through an extensive literature review, prior to any field testing.
- Utilising established research methodology under the governance of an expert panel, which included consumer input, ensured that the QIs developed were of the highest quality, covering all potential areas of care prior to field testing.

### TRAINING LOCAL HEALTH WORKERS HOW TO TEACH PELVIC FLOOR MUSCLE EXERCISE TO WOMEN LIVING IN RURAL NEPAL

**Caagbay D<sup>1</sup>**, Black K<sup>1</sup>, Wattimena J<sup>1</sup>, Bhatt S<sup>2</sup>, Raynes-Greenow C<sup>1</sup>

<sup>1</sup>The University of Sydney, Sydney, Australia, <sup>2</sup>Centre for Agro-Ecology and Development, Kathmandu, Nepal

#### Aim:

To determine if an educational workshop on pelvic floor muscle (PFM) exercise for Axillary Nurse Midwives (ANM) increases knowledge, confidence and ability to correctly teach a PFM contraction to women living in rural Nepal

#### Design:

Pretest-posttest study design

#### Method:

Local ANMs from three rural regions in Nepal were invited to attend one-day training workshops. Using structured questionnaires we assessed baseline and post workshop knowledge and confidence on PFM exercise. The following day, we assessed the ability of three ANMs to teach local community women how to contract their PFMs. A correct PFM contraction was determined using transabdominal real time ultrasound to visualise upward movement of the PFMs without breath holding or co-contraction of other muscles.

#### Results:

There were 88 ANMs who attended the three training workshops (mean age 30 years). The post workshop median knowledge score was higher (19 vs 14) as was the confidence score (33 vs 21) and the median change for both was significant (p<0.001). After participating in the workshop, ANMs were able to teach 46% of women from the local community to perform a correct PFM contraction.

#### Conclusion/key Practice Points:

- A one-day training workshop on PFM exercise significantly increased ANMs knowledge and confidence in teaching ability and this translated into being able to successfully teach almost half of the local women to perform a correct PFM contraction
- Training local paraprofessionals on PFM exercise may be a worthwhile strategy to reach women in rural settings who are at risk of pelvic floor disorders

## TREATMENT OF A KANGAROO WITH TARSAL JOINT CONTRACTURE

**Nicholson H<sup>1</sup>**

<sup>1</sup>*Whole Family Health, St Marys, Australia*

### Background:

It is common for WIRES and similar rescue organisations to approach physiotherapists for assistance with injured wildlife.

### Aims / Objectives:

This case study will provide participants with awareness of treatment techniques applicable for use in cases similar to this kangaroo, who had been injured when caught in a barbed wire fence.

### Approach:

The presenter will use photographs, videos and objective measures to describe the physiotherapy techniques used to treat the tarsal joint contracture in this juvenile kangaroo.

Conclusion / Key Practice Points: Participants will have an awareness of:

- Macropod anatomy;
- Quintipedal gait biomechanics;
- The application of physiotherapy techniques to assist in the management of tarsal joint contracture following injury by being caught in a barbed wire fence.

## TYPES, MECHANISMS AND SETTINGS OF SENTINEL AND SUBSEQUENT INJURIES: A PROSPECTIVE COHORT STUDY

**Aldabe D<sup>1</sup>**, Harcombe H<sup>1</sup>, Davie G<sup>1</sup>, Wyeth E<sup>1</sup>, Samaranayaka A<sup>1</sup>, Derrett S<sup>1</sup>

<sup>1</sup>*Preventive and Social Medicine, University of Otago, Dunedin, New Zealand*

### Aims:

To: 1) describe types, settings and mechanisms of subsequent injuries occurring in the 24-months following an injury (sentinel injury) which led to recruitment, and 2) explore relationships between sentinel and subsequent injuries.

### Design:

Prospective cohort.

### Method:

2856 injured participants were followed for 24 months after entering New Zealand's Accident Compensation Corporation's (ACC) entitlement claims register. Injury data, collected from ACC, included: the type of injury, the setting and the mechanism. These descriptive analyses report frequencies of sentinel and subsequent injuries, and contingency tables assessed concurrence.

### Results:

Among 2856 participants, 1653 (58%) had at least one subsequent injury over 24 months. The most common types of subsequent injury were: spine (50%) and lower extremity (41%) dislocation/sprains/strains. Home, recreation and commercial settings were common for both sentinel and subsequent injuries. For example, of the 486 participants who had a sentinel injury at home and at least one subsequent injury, 62% also had a subsequent injury at home. Frequent mechanisms of subsequent injury were walking/running and lifting/loading which accounted for 30% and 26% of the subsequent injury claims, respectively.

### Conclusion:

People who experience certain types of sentinel injury presented higher frequency of certain types of subsequent injury. Similarly, specific settings and mechanisms of sentinel injury appear to affect the distribution of subsequent injury settings and mechanisms. Knowledge about such factors has potential for interventions to prevent subsequent injury for people who have come to the attention of ACC, physiotherapists, and other health providers, for sentinel injury treatment.

## UNWANTED MUSCLE ACTIVITY REDUCES PASSIVE JOINT ANGLE DURING THE STRAIGHT LEG RAISE TEST

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<sup>1</sup>The University of Sydney, Lidcombe, Australia, <sup>2</sup>Neuroscience Research Australia, Randwick, Australia

### Aim:

To determine whether unwanted hamstring muscle activity confounds measures of passive hip joint angle during the straight leg raise test.

### Design:

Assessor-blinded cross-sectional study.

### Methods:

Thirty able-bodied adults were tested. Force and hamstring muscle activity (measured with surface electromyography, EMG) were recorded as subjects performed knee flexion maximum voluntary contractions (MVC) in supine, with hip neutral and the knee extended. Subjects were asked to relax. The hamstring muscles were then titanicallly stimulated at 50 Hz using surface electrodes to obtain EMG matched to target levels of 0, 2.5, 5, 7.5 and 10% of MVC force, in random order. For each target level, an investigator blinded to the level of stimulation performed a straight leg raise test by raising the tested leg while keeping the knee extended, and stopped the test when the knee started to bend. Hip joint angle at the end of the straight leg raise test was recorded for each target level. Linear regression was used to determine the effect of level of stimulation on hip angle. Regression coefficients from all subjects were pooled to determine the average effect.

### Results:

Hip joint angle decreased by 0.57 degrees on average for every 1% increase in MVC EMG (mean regression coefficient = -0.57, 95% CI -0.88 to -0.27, p=0.0012).

### Conclusion:

Unwanted hamstring muscle activity significantly reduces hip joint angle during the straight leg raise test. That is, low levels of unwanted muscle activity have potential to confound measures of passive joint range of motion in common clinical tests.

## USING STUDENT FEEDBACK TO GUIDE CLINICAL PLACEMENT DEVELOPMENT: IMPROVING THE PROGRAM FOR STUDENTS AND EDUCATORS ALIKE.

**Riglar E<sup>1</sup>**

<sup>1</sup>Melbourne Health, Parkville, Australia

At Melbourne Health, students complete feedback forms at the completion of every clinical placement. This project evaluates the effect of implementing change based on themes identified from this student feedback.

### Method:

Students anonymously completed feedback forms at the end of each musculoskeletal clinical placement at The Royal Melbourne Hospital City Campus over 2015-16. Data were analysed to identify trends. 10 feedback forms were gathered pre intervention and 19 post intervention. Students came from two universities and a variety of levels of experience. Analysis of feedback occurred at the end of the first year. Major “themes” of student dissatisfaction were identified, reflected on, and correlated with supervisor feedback. Strategies to address identified modifiable issues were established within the team and implemented for the next year of students.

### Results:

Data collected from student’s pre intervention showed > 50% frequency of comments around themes of “orientation process/expectations” and “feedback/supervisors”.

Following a number of changes being made to orientation and timetabling, data collected from the subsequent cohort identified <20% frequency of feedback pertaining to these themes.

**Discussion:**

This quality assurance project demonstrates feedback from students can successfully contribute to development of quality clinical education delivery. Of interest, issues most commonly identified by students correlated with challenges identified by supervisors. Outcomes indicate a role for consistent program evaluation and modification with consideration of both students and staff. Further research is required to fully understand the scope for student involvement in the development of clinical education programs.

## VISUAL PERCEPTUAL FUNCTIONING IN CHILDREN WITH SPECIFIC LANGUAGE IMPAIRMENT

**Nicola K<sup>1</sup>**, Watter P<sup>1</sup>

<sup>1</sup>*The University of Queensland, St Lucia, Australia*

**Aim:**

This study aims to explore the visual perceptual performance of children with severe specific language impairment.

**Design:**

A retrospective review of chart files.

**Method:**

Participants included children enrolled in a dedicated school, verified under the speech-language impairment category of The Education Adjustment Program, and diagnosed with a specific language impairment. Files were reviewed to obtain results of the Developmental Test of Visual Perception – 2nd Edition.

**Results:**

The final study group (n = 56, males = 41) included children 4 to 10 years old. Overall, 35% of children had visual perceptual problems. Of this group of children, 31% had motor-reduced visual perceptual problems while 40% presented with motor-enhanced visual perceptual problems. The subtest that this group performed the worst on was the visual-motor speed subtest. Mean performance for females was lower than males on all subtests, and reached significance on two motor enhanced subtests.

**Conclusion:**

- Problems in this cohort of children reflect not just a pure visual perceptual problem, but rather the integration of visual and motor systems, or the integrity of the motor system itself
- Poor performance on the visual-motor speed subtest suggest ineffective motor movements, warranting physiotherapy screening of this cohort of children
- Females performed particularly poorly when a motor demand was present
- Clinicians may need to consider appropriateness of supplementary visual communication strategies when a child presents with visual perceptual problems
- Multidisciplinary management is optimal for children with severe specific language impairment to address their multi-faceted presentation.

## WHAT IS 'USUAL PHYSIOTHERAPY CARE' FOR OLDER PEOPLE UNDERGOING REHABILITATION?

**Said C<sup>1,2,3</sup>**, Morris M<sup>3,4</sup>, McGinley J<sup>2</sup>, Wittwer J<sup>3</sup>, Hill K<sup>5</sup>, Szoeki C<sup>2</sup>, Bernhardt J<sup>6</sup>

<sup>1</sup>*Austin Health, Heidelberg, Australia*, <sup>2</sup>*The University of Melbourne, Parkville, Australia*, <sup>3</sup>*La Trobe University, Bundoora, Australia*, <sup>4</sup>*Healthscope, Bundoora, Australia*, <sup>5</sup>*Curtin University, Perth, Australia*, <sup>6</sup>*The Florey Institute of Neuroscience and Mental Health, Heidelberg, Australia*

**Aim:**

To quantify 'usual physiotherapy care' in older people receiving inpatient rehabilitation.

**Design:** S

Ubanalysis of a single-blinded, multisite randomised controlled trial.

#### Method:

Older people (n = 198; median age 80.9 years, IQR 76.6- 87.2; baseline median gait speed = 0.3 m/s, IQR = 0 – 0.5) undergoing inpatient rehabilitation to improve mobility were recruited from geriatric rehabilitation units at two hospitals. Physiotherapy staff providing 'usual care' to participants recorded time spent performing various activities during each physiotherapy session. Median (interquartile ranges; IQR) minutes per person per day were calculated for each activity.

#### Results:

Participants had 1 (IQR 1 - 2) physiotherapy session per day and spent 40 minutes (IQR 33 - 50) per day in physiotherapy. Most time per day was spent performing gait activities [10 minutes (IQR 7.5 -15)], sit to stand [5 minutes (IQR 3 - 5) and resting [8 minutes (IQR 5 - 10)]. Little time was spent performing standing or lower limb strength training in standing [0 minutes (IQR 0 - 5)], lower limb strength training in sitting or lying, sitting balance, bed mobility, upper limb tasks, hydrotherapy or education [0 minutes (IQR 0 – 0)].

#### Conclusion/Key Practice Points.

- This is the first Australian study to quantify usual care physiotherapy in a large group of older people undergoing inpatient rehabilitation. While there are limitations, it provides clinicians and researchers vital insight into current practice.
- Most active physiotherapy time was spent performing gait and sit to stand activities, reflecting their common goal to improve mobility.

#### WHAT IS KNOWN ABOUT THE ACCURACY OF DIAGNOSTIC TESTS USED BY PHYSIOTHERAPISTS?

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#### Aim:

To determine the extent and scope of studies of the accuracy of diagnostic tests used by physiotherapists.

#### Design:

Systematic review.

#### Method:

A comprehensive search was conducted for studies of the accuracy of diagnostic tests used by physiotherapists. Studies of interest were those that (a) investigated the accuracy of an index test that is or could be used by a physiotherapist to diagnose a recognisable pathology, and (b) compared the outcomes of an index test with a reference test on a sample that included people with and without the diagnosis. The search was conducted on MEDLINE, EMBASE and CINAHL up to August 2015. Search terms included synonyms for physiotherapy practice AND diagnostic tests. Titles, abstracts and full text were screened by two researchers.

#### Results:

The search yielded 25,214 titles. Screening identified 996 studies of the accuracy of diagnostic tests used by physiotherapists. The most frequently studied diagnoses were joint pathologies and fractures (both 12% of all studies), asthma (10%) and compression neuropathies (7%). Most studies were of "physical examination" (61%); fewer studies were of "questions" (39%) and "health technologies" (23%). The most frequently studied subdisciplines were musculoskeletal (75%), orthopaedics (38%), cardiothoracics (15%), paediatrics (14%) and women's health (7%). The most frequently studied body parts were the chest (16%), head/neck (14%), lumbar spine/pelvis (13%) and shoulder (12%).

#### Conclusion/Key Practice Points:

- There is a large body of evidence examining the accuracy of diagnostic tests used by physiotherapists.
- Most studies are of "physical examination" procedures used in musculoskeletal and orthopaedic physiotherapy.

## WHAT IS USUAL CARE FOR PHYSIOTHERAPY IN A SUBACUTE INPATIENT REHABILITATION SETTING? AN OBSERVATIONAL STUDY

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### Aim

The purpose of this study was to define physiotherapy 'usual care' in inpatient rehabilitation for people with mobility deficits, describing, the amount of therapy provided, dosage of therapy received, and the type of activities performed.

### Design:

Prospective observational study.

### Method:

Individual physiotherapy sessions of patients from three rehabilitation wards from a metropolitan hospital in Adelaide were observed. Components of intervention were divided into 14 therapeutic categories, covering activities of sitting, standing, walking, transfers, strength training (upper and lower limb), range of motion, fitness, upper limb activities, massage and rest. Definitions of movements, units of repetition and time duration were used to record observations.

### Results:

Exercise type, exercise duration and number of repetitions were recorded during 51 therapy sessions, including 30 patients (17 male, mean age 75.9±9.5 years). The mean intervention time was 28.8±9.0 minutes, of which 24.1±7.5 minutes (84%) was active time. The most prevalent activity was walking, observed in 73% of the observed sessions (mean 33.8±37.3 meters), followed by sit-to-stand transfers (53%, mean 5.8±9.0 repetitions), standing (51%, mean 4.0±5.5 minutes), fitness (41%, mean 3.6±5.1 minutes) and lower limb strength training (39%, mean 14.7±23.7 repetitions).

### Conclusion:

Physiotherapy sessions with inpatients receiving rehabilitation have a duration of nearly half an hour, focusing mostly on lower limb exercises. These results contribute to the definition of usual care in physiotherapy, providing comparative data for clinical rehabilitation studies, crucial to accurately compare, interpret research findings of studies comparing different therapies.