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ABSTRACTS

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These abstracts are scientifically evaluated by the organizing committee and not by the journal.
ORIGINAL RESEARCH

PMR – 101
INCREASING CARDIAC REHABILITATION REFERRALS AMONGST STROKE PATIENTS: A QUALITY IMPROVEMENT PROJECT
Kimberly Coros, MD, Catherine Ho, MD, Christian Fortin, MD, Beverly Moylan, MD, Ali Nolin, MD, Jeremy Fennell, MD, Alex Lo, MD, FRCPC
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Objective: To determine the ability-related, social, or environmental factors identified by adult spina bifida as barriers to employment. Design: This cross-sectional survey described demographics, performance (independence, social isolation and mobility), and attitudes and opinions about environmental factors of spina bifida related to barriers to employment. Setting: Academic teaching hospital. Participants: Nine Adult (>18) spina bifida. Intervention: Interviews had both quantitative and qualitative components, with equal priority. Besides their age, sex and type of spina bifida, participants were asked employment in the open market or a sheltered workplace and hours per week. If no paid employment, they were asked whether: 1) attending a day centre, 2) full-time education, 3) looking for employment, 4) volunteer work, 5) inactive. CHART assessed cognitive independence, physical independence, mobility and social integration. Chief assessed environmental barriers, support/attitudes at home/community, transportation, medical care, availability information, education, and government policies. Results: Qualitative component was audio recordings of interviews transcribed into separate documents. 3/9 employed – 1 in sheltered workplace, 1 part-time in open market, and 1 full-time open market. 2/9 looking for work, 2/9 in full-time education (2/9 university, 1/9 high school) 1/9 inactive. Barriers to employment were: personal, transportation, employer, physical/social environment, and programs/services. Conclusions: Age 40 were employed. 2/9 working in the open market have the lowest CHIEF scores. Participant working in a sheltered workplace had lower CHART score than two working in open market. Barriers include apprehension about work, transportation problems, washroom accessibility, and role of Disability assistance programs. Key words: adult, employment, spina bifida.

PMR – 103
BARRIERS TO EMPLOYMENT FOR ADULT SPINA BIFIDA
David Berbrayer
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Objective: To determine the ability-related, social, or environmental factors identified by adult spina bifida as barriers to employment. Design: This cross-sectional survey described demographics, performance (independence, social isolation and mobility), and attitudes and opinions about environmental factors of spina bifida related to barriers to employment. Setting: Academic teaching hospital. Participants: Nine Adult (>18) spina bifida. Intervention: Interviews had both quantitative and qualitative components, with equal priority. Besides their age, sex and type of spina bifida, participants were asked employment in the open market or a sheltered workplace and hours per week. If no paid employment, they were asked whether: 1) attending a day centre, 2) full-time education, 3) looking for employment, 4) volunteer work, 5) inactive. CHART assessed cognitive independence, physical independence, mobility and social integration. Chief assessed environmental barriers, support/attitudes at home/community, transportation, medical care, availability information, education, and government policies. Results: Qualitative component was audio recordings of interviews transcribed into separate documents. 3/9 employed – 1 in sheltered workplace, 1 part-time in open market, and 1 full-time open market. 2/9 looking for work, 2/9 in full-time education (2/9 university, 1/9 high school) 1/9 inactive. Barriers to employment were: personal, transportation, employer, physical/social environment, and programs/services. Conclusions: Age 40 were employed. 2/9 working in the open market have the lowest CHIEF scores. Participant working in a sheltered workplace had lower CHART score than two working in open market. Barriers include apprehension about work, transportation problems, washroom accessibility, and role of Disability assistance programs. Key words: adult, employment, spina bifida.

PMR – 104
FACTORS INFLUENCING THE CHOICE OF COMPLEMENTARY AND ALTERNATIVE THERAPY IN CEREBRAL PALSY ADULTS
David Berbrayer
Sunnybrook Health Sciences Centre

Objectives: to examine the predicting factors that contribute to the use of CAM (Complementary and Alternative) therapies in Adult Cerebral Palsy (CP). Design: cross sectional study. Setting: academic teaching hospital. Participants: 21 adult CP (>18 years). Intervention: A written survey asked questions in three main areas: 1) Clinical history-type of CP/complications; 2) Demographics- gender, age, education, income, and culture; and, 3) Use of CAM-definition of CAM offered by the National Center for Complementary and Alternative Medicine (NCCAM). Outcomes: The main outcome variable in the analysis was CAM use versus no CAM use. Possible predictive factors assessed were age, gender, level of education, income level, type of CP, area of body affected, symptoms/complications of disease, severity of disease. Results: 21/23 participants completed the survey; a response rate of over 91%. 10/21 had used one or more CAM techniques within past year (48% respondents). Most common form of cerebral palsy was spastic (12/21). Analysis of our data was unable to detect a link.
between use of CAM and severity of disease. Mobility responses were: moves with assistance or non-ambulatory. Complications of CP were spasticity, communication issues, and pain. Conclusions: 47% CAM therapy use was manipulative and body-based method (massage therapy, acupuncture, chiropractic manipulation, aquatherapy, and hypertherapy). Analysis of data was unable to detect a link between CAM and culture. The general use of CAM in adults did not identify income as a predictive factor. No link found between use of CAM and education or use of CAM and gender. Key words: adult, cerebral palsy, complementary and alternative medicine.

PMR – 105
PREVENTING FURTHER AMPUTATION IN ADULT DIABETIC AMPUTEES
David Berbrayer
Sunnybrook Health Sciences Centre

Objective: To identify strategies used by diabetic amputees to prevent further amputation. Design: A cross-sectional survey was conducted on diabetic amputee >18 years. Setting: academic teaching centre. Participants: 10 adult diabetic amputees. Intervention: A 26-question self-administered questionnaire was used to obtain information on demographic and clinical characteristics as well as foot care, lifestyle modifications, and compliance with medication and blood glucose monitoring. Outcomes: Questions were selected from Summary of Diabetic Self-Care Activities Measure. Results: Ten type 2 diabetes mellitus–mean age was 61 years. 80% male. 50% single. 80% living with family. 80% annual income of 0–$19,999. 60% college or university education. Mean body mass index was 32 kg/m. Participants were diagnosed with diabetes 17 years ago, and received a lower limb amputation 3 years ago. Mean time between diagnosis and amputation was 14 years. 90% had below knee amputation, and 10% above knee amputation. 50% checked feet daily within the past week. 50% wore special shoes. 40% wore socks. 20% compliant with blood sugar monitoring. 40% walked 30 minutes/week. Conclusions: Compliance with foot care poor among diabetic amputees. Adherence to eating plan and regular physical activity poor. Providers should improve self-care among diabetic amputees through education. Healthcare professionals should discuss foot care and general diabetes self-management after an amputation, and repeat discussion of self-care at follow-up. Literature suggests face-to-face education of self-care is more effective than delivery methods, and use of booster sessions improved clinical outcomes. Interactive education methods are highly effective on patient behavior comparing to didactic. Diabetics had equally poor foot care after and before amputation. Key words: adult, amputation, diabetes.

PMR – 106
BRIDGING THE GAP: THE ROLE OF PHYSIATRISTS IN CARING FOR ADULTS WITH CEREBRAL PALSY
Caitlin Cassidy1, Nerissa Campbell2, Mona Madady2, Michael Payne1
1Western University, Department of Physical Medicine and Rehabilitation, 2Lawson Health Research Institute

Context: Individuals with Cerebral Palsy (CP) experience a significant gap in care as they move from interdisciplinary pediatric settings to adult care. CP are spasticity, communication issues, and pain. Conclusions: Efforts to remove identified barriers to further physiatric engagement in the care of adults with CP may result in improved access to needed care for these patients, but further research is required. Key words: cerebral palsy, physical rehabilitation medicine, transition to adult care.

PMR – 107
CARING FOR ADULTS WITH CEREBRAL PALSY: PERSPECTIVES OF PHYSIATRY TRAINEES
Caitlin Cassidy1, Nerissa Campbell2, Mona Madady2, Michael Payne1
1Western University, Department of Physical Medicine and Rehabilitation, 2Lawson Health Research Institute

Objective: To determine if the lumbar quadrant test (QT) is effective in diagnosing facetogenic chronic low back pain (CMLBP). Design: Single-blinded prospective cohort. Setting: Multidisciplinary chronic pain centre. Participants: Thirty adult subjects (7 females and 6 males; age 45.7 years, SD 14.2; body mass index (BMI) 30.6, SD 8.6) with clinically diagnosed facetogenic CMLBP, referred for bilateral L4/L5 and L5/S1 medial branch blocks (MMBs). Diagnostic Performance Evaluation: The QT, consisting of lumbar extension, ipsilateral side bending and ipsilateral rotation was performed before and after MMBs. QT pain scores were recorded on a 10 cm visual analog scale (VAS). Outcome Measure: Percentage pain relief after MMBs. Results: Subjects’ initial QT pain score, averaged between left and right sides (iQT), showed a significant positive correlation with percentage pain relief after MMBs (Pearson correlation 0.568,
PMR – 109 AWARD WINNER

IS SELF-REPORT OF NEUROLOGICAL IMPAIRMENT AMONG PERSONS LIVING WITH CHRONIC SPINAL CORD INJURY SUFFICIENTLY ACCURATE FOR RESEARCH STUDIES?

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1Toronto Rehabilitation Institute-University Health Network, 2University of Toronto

Context: Self-reported impairment is commonly used in spinal cord injury (SCI) research studies (i.e., survey) or to prescreen individuals for clinical trial eligibility. Self-reported impairment is less intrusive than medical assessments or chart abstraction. Objective: We sought to determine the accuracy of self-reported neurological impairment among Ontarians with chronic SCI. Design: Accuracy study. Participants Setting: Community-dwelling adults (n=258; 69% male), with chronic SCI (C1-T12 AIS A-D), age 24–85 years, mean 19.7 years post-injury. Interventions: Participants were read a lay description of the neurological level of injury (NLI) and ASIA impairment scale (AIS) categories from the International Standards of Neurological Classification of Spinal Cord Injury (ISNCSCI) via telephone survey. Participants were asked to select the most appropriate description of their impairment. Date of injury (DOI), etiology, NLI and AIS as per ISNCSCI obtained via self-report were cross-validated with medical charts. Outcome Measures: Cohen’s kappa and intraclass correlation coefficient (ICC) statistics were used to calculate percent agreement between the survey and chart abstraction data. Results: Cohen’s kappa for type, severity and cause of injury between the two data sources ranged from 0.738–0.992 (p-value <0.001). Patient self-report and medical record NLI, AIS scale and date of injury were compared using ICC (95% confidence interval, one-way random, absolute agreement) and were 0.789 and 0.887, respectively, p<0.001. Conclusions: There is good agreement between the SCI patient’s self-reported impairment and abstracted medical record data regarding type, severity, and cause of SCI, NLI, AIS and DOI. The observed level of agreement between impairment self report and chart abstraction among participants with a post secondary education is appropriate for ongoing use in observational surveys or prescreening research study subjects. Key words: self report, spinal cord injury, neurological impairment.

PMR – 110

EVALUATING PRACTICE PATTERNS IN THROMBOEMBOLISM PROPHYLAXIS IN ADULTS WITH SPINAL CORD INJURY: PRACTICE OF CANADIAN SPINAL CORD INJURY REHABILITATION PHYSIATRISTS

George Deng1, Karen Ethans1, Andrea Townsend2, Géraldine Jacquemin1, Christine Short4, Colleen O’Connell5, Karen Smith1, Sussan Askari1, Chester Ho6, Denise Hill1, B. Catharine Craven1
1University of Manitoba, 2University of Vancouver, 3Dalhousie University, 4Queen’s University, 5University of Calgary, 6University of Ottawa

Context: According to current practice guidelines presented in Chest Medicine in 2012, the Paralyzed Veterans Guidelines in 1997, and a review by Teasell in 2009, the practice for venous thromboembolism (VTE) prophylaxis in spinal cord injury (SCI) includes low molecular weight heparin in combination with a mechanical prophylaxis. These guidelines are based on research done in the late 1990s and early 2000s. No previous study has evaluated the practice of Canadian physiatrists on the use of VTE prophylaxis among patients with acute SCI. Objective: The objective of this study is to ascertain practice patterns of thromboembolism prophylaxis by Canadian SCI Rehabilitation Physiatrists in adults admitted to a spinal cord injury rehabilitation center. Design: A poll was distributed to Canadian SCI Rehabilitation Physiatrists through the “SCI Hallways”, an online forum for consultation between Canadian physiatrists. Results: A total of 10 physiatrists from eight of thirteen (62%) Canadian Spinal Cord Injury Rehabilitation units participated. All participants stated that their practice involved using low molecular weight heparin and a form of mechanical VTE prophylaxis initially for 8 to 12 weeks depending on the presence of additional VTE risk factors. Conclusions: Current Canadian practices match current guidelines for VTE prophylaxis in spinal cord injury. Key words: data collection, spinal cord injuries, venous thromboembolism.

PMR – 111

THE FAMILY CONFERENCE RATING SCALE: DELINEATING THE ESSENTIAL FAMILY CONFERENCE COMMUNICATION AND COLLABORATION SKILLS FOR HEALTH CARE PROFESSIONALS

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Context/Objective: There is a paucity of evidence-based literature on the essential communication and collaboration skills to guide health care teams in conducting and assessing their performance in the family conference (FC). The authors developed and validated a rating scale of team FC performance, the Family Conference Rating Scale (FCRS). Design/Setting/Participants: In phase 1, essential FC communication and collaboration skills were identified through a review of existing communication tools and literature on team functioning; a draft 34-item scale was developed. In phase 2, the scale was narrowed to a 6-item, 9-point scale with descriptors of expected behaviours through an iterative process: testing of the scale on 10 FC transcripts by two experts, soliciting feedback from a focus group of seven health care providers, and testing by non-experts on 49 live FCs. In phase 3, the revised scale was validated by 10 health care providers from different disciplines by rating three videos of FCs of variable quality. Outcome Measures: Validity evidence was collected through factorial analysis of variance assessing inter-video variation, and generalizability analysis for FCRS reliability and inter-rater reliability. Results: Raters were able to detect inter-video variation in FC quality. The reliability of the FCRS was 0.95 and the inter-rater reliability, 0.68. Conclusions: The FCRS will enhance the ability of health professions educators to teach and assess interprofessional patient-centred communication and collaboration competencies. Key words: rating scale, family conference, interprofessional team.

PMR – 112

LOW VITAMIN B12 IN PATIENTS UPON ADMISSION TO AN AMPUTEE REHABILITATION UNIT: A RETROSPECTIVE CHART REVIEW

Eric Earl
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Objective: To determine the prevalence of low vitamin B12 (VB12) in patients on admission to an amputee rehabilitation unit and identify specific populations at risk. Design: Retrospective chart review. Participants: 127 subjects comprised of patients with major lower limb amputations admitted to a Regional Amputee Rehabilitation Program between January 1, 2011 and December 31, 2012. Methods: Electronic medical records were reviewed for demographic data, amputation data, medication history, serum VB12 levels and other related blood work. A literature-based cutoff of VB12 <260 pmol/L was used. Results: The prevalence of low VB12 was 59.8%. Serum VB12 levels were significantly lower among patients 55 years and older (p<0.05), and among patient with a mean corpuscular volume >97 fl (p=0.01). Patients 55 years and older were found to have an increased prevalence of low VB12 (p=0.05). No other differences in prevalence were determined among different demographics, etiologies or comorbidities. Conclusions: Patients with an amputation have a much higher prevalence of low VB12 levels compared to the general population. Low VB12 status may impact rehabilitation outcomes through anemia, cognitive decline, and neuropathy. No reliable indicators for which patients should be screened were found and therefore a universal approach to screening and treatment is needed. Key words: vitamin B 12, rehabilitation centre, mass screening.

PMR – 113
FACTORS ASSOCIATED WITH RETURN-TO-WORK FOLLOWING WORK-RELATED FOOT AND ANKLE INJURIES
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Altum Health, University Health Network

Context/Objective: Sick leave following workplace foot and ankle injury is a major challenge as it is costly, negatively impacts workplace productivity and can lead to loss of self-esteem and stress in family relationships. Our study examined the association between modifiable factors and return-to-work (RTW) among injured workers. Design: Retrospective cohort study. Setting: A multidisciplinary foot and ankle treatment program in Ontario, Canada. Participants: The study included 88 injured workers discharged between October 2010 and July 2013 with 73% being male at a mean age of 47 years. Only clients that were not working at intake were included in our study. Outcome Measures: Relevant covariates, including demographic data, time from injury and functional scores were recorded. Our primary outcome, RTW, was assessed at 3 months follow-up. Logistic regression was used to identify those factors associated with a successful RTW. Results: By 3 months post-treatment discharge 28 (32%) of the clients were able to RTW. Logistic regression revealed that a shorter time since injury was the only variable in our study that was significantly associated with RTW at 3 months follow-up (p=0.05). Age, gender, level of education, LEFS, PCS and PHQ-9 scores at intake were not significantly associated with RTW. Conclusions: Time from injury to referral for treatment is a strong predictor of vocational outcome following treatment. Workers compensation boards should refer foot and ankle injured workers to treatment programs as early as possible to achieve a more successful RTW. Key words: return to work, lower extremity, vocational rehabilitation.

PMR – 114
SPASTICITY HEALTH LITERACY AMONG CANADIAN FAMILY PHYSICIANS
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West Park Healthcare Centre

Context/Objective: A previous survey of family physicians in Ontario showed deficiencies in recognizing spasticity and knowledge of treatments. The current study assessed spasticity related literacy among family physicians across Canada and if the literacy was related to gender, Canada versus international medical training, and years of experience among family physicians. Design: This study was a cross-sectional online survey, using the web portal fluidsurvey.com. Survey was sent via email to 2,795 family physicians across Canada. A French translation of the survey was sent to those located in Quebec. Results: Out of the 2,795 emails sent to physicians, 564 emails bounced or were incorrect. Out of the 2,231 emails successfully sent, 111 completed the online questionnaire (5.0% response rate). Response rate was similar across provinces. Eighty-four of the respondents were Canada-trained, while 27 were internationally-trained. Only 24.5% of all respondents were able to correctly identify the definition of spasticity and 32.4% felt adequately trained to recognize spasticity in the community. Results indicated that Canada-trained physicians were 2.6 times more likely than internationally-trained physicians to correctly identify the treatment for focal spasticity. Furthermore, Canada-trained physicians were 2.3 times more likely than internationally-trained physicians to identify the correct treatment for generalised spasticity (p=0.05). Gender and years of experience did not influence any answers. Key words: muscle spasticity, botulinum toxins, family physicians.

PMR – 115
THE DEVELOPMENT OF A CLINICAL PRACTICE GUIDELINE FOR THE DIAGNOSIS AND MANAGEMENT OF NEUROPATHIC PAIN FOLLOWING SPINAL CORD INJURY
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Context/Objective: Evidence-based management of neuropathic pain (NP) following spinal cord injury (SCI) continues to present a challenge. We are in the process of developing the first Canadian clinical practice guideline for the screening, diagnosis and management of NP for rehabilitation in persons with SCI. Design: Two-year project with a modified GRADE approach. Setting: Canadian rehabilitation centre focus. Participants: Steering Committee, Working Groups, methodologist, external stakeholders. Interventions: An extensive literature review was conducted. Subject matter experts were identified and invited to form an international Working Group. This Group will form recommendations by identifying areas of interest, evidence evaluation and panel consensus. External stakeholder review will occur. Guideline dissemination will take various forms depending on the audience. Outcome Measures: Alignment with AGREE. Results: The Working Group was formed (n=23), consisting of physiotherapists (2), neurologist (1), neurosurgeon (1), SCI consumer (1), physiatrists (7), nurse (1), psychologists (2), research scientists (7), and healthcare administrator (1). Eight questions pertaining to areas of interest were developed. A modified GRADE approach was used to assess evidence which will inform recommendation development. Three groups of experts reviewed the evidence in a first meeting. Recommendations continue to be developed; these will be presented to the full panel for consideration. Conclusions: The initial phase of development suggests these guidelines will be a useful tool for clinicians who manage persons with central NP after SCI. The Working Group will next draft recommendations to present to the full panel for consensus; guideline completion is expected in early 2015. Key words: practice guideline, pain management, spinal cord injuries.

PMR – 116
PROTOTYPE OF WIRELESS ENABLED PRESSURE SENSING LAYER TO PREVENT ULCERS IN PATIENTS WITH SPINAL CORD INJURY

J Rehabil Med 46
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Context: About one third of persons with spinal cord injury living in the community are reported to have pressure ulcers, which may require lengthy hospitalizations and substantial costs. Objective: To develop an economical prototype pressure sensing layer that can alert users wirelessly on their smart phone of high sustained pressure to prevent ulcer formation. Methods: A 40 cm × 40 cm pressure sensing layer was created, that consisted of 80 resistive sensor strips that passed voltage to 16 analog multiplexers. The signals were then processed through an analog to digital converter and passed onto a microcontroller. The system recorded pressure readings and cumulated time for each sensor, and allowed for comparison to a threshold value. The pressure data was plotted in 2D and 3D mapping views through MATLAB. The controller would wirelessly send notifications of high pressure values that were sustained for greater than 15 minutes that exceeded a predetermined threshold value to an Android phone through Bluetooth. Results: Multiple trials of pressure values from able bodied persons sitting on the sensing layer were successfully sent from the controller and mapped without delay. High pressure areas were color coded and mapped to location. Areas of sustained high pressure were successfully communicated via Bluetooth to the smart phone. Conclusions: An economical (~$350 total cost) pressure sensing and mapping system with wireless communication to a smart phone was successfully designed and built, and has high potential for providing a means for preventing pressure ulcers in persons with spinal cord injury. Key words: pressure sensor, ulcer prevention, spinal cord injury.

PMR – 117
EVALUATION OF HEALTH UTILITY IN PATIENTS RECEIVING ONABOTULINUMTOXINA (BOTOX) FOR THE TREATMENT OF ADULT FOCAL SPASTICITY: RESULTS FROM MOBILITY, A PROSPECTIVE OBSERVATIONAL COHORT STUDY
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Context: OnabotulinumtoxinA (onabotA) has been approved in Canada since 2001 for the management of adult focal spasticity (AFS). Many studies have reported on the clinical efficacy of onabotA, but patient-reported outcomes (PRO) data is limited. Objective: MOBILITY evaluates health utility (HU) related to the clinical use of onabotA across several indications including AFS. Design: Multi-center, observational study collecting PROs in patients initiating (naïve) or receiving ongoing (maintenance) onabotA treatment. HU was the primary outcome measure obtained from the SF-12 Health Survey using the SF-6D, collected at baseline, week 4 post-treatment and up to 5 subsequent injection visits. Results: 440 patients with AFS (mean age, 52.7 yrs) were enrolled in MOBILITY. The most common etiologies reported were stroke (n = 222), multiple sclerosis (MS; n = 61) and spinal cord injury (SCI; n = 45). Eighty-seven percent (86.8%) of patients were Caucasian, 50.2% female and 39.8% were naïve to treatment. Highest mean baseline HU scores were in traumatic brain injury patients (0.655) vs. stroke (0.634), SCI (0.604), and MS (0.589). Improvements in HU scores from baseline were seen in all cohorts across all visits. Baseline scores were generally higher in maintenance vs. naïve; however, mean changes from baseline were greatest in naïve patients. The AFS cohort reported 37 adverse events in 21 patients; 16 (43.2%) were serious and 17 (45.9%) considered unrelated to treatment. Conclusions: MS patients have the lowest HU scores compared to the other cohorts. HU can improve over time in patients with focal spasticity due to various etiologies. Key words: muscle spasticity, botulinum toxin, HU, type A, health surveys.

PMR – 119
THE IMPORTANCE OF PHYSICAL ACTIVITY AND Peer RELATIONSHIPS FOR THOSE LIVING WITH TRAUMATIC SPINAL CORD INJURY IN SASKATCHEWAN
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1University of Saskatchewan, 2University of Regina, 3Saskatoon Health Region, 4Universite Laval

Objective: To identify health and wellness benefits of physical activity as perceived by those with traumatic spinal cord injury (tSCI). Design: Basic interpretive descriptive study. Setting: Saskatchewan, Canada. Participants: Adults with tSCI. Outcome Measures: Qualitative interview. Results: Participants were asked about their experiences of living with tSCI in Saskatchewan, including changes that have occurred since their injury. Twenty-three adults released their transcript for analysis. Although most reflected on the physiological changes since the time of their injury, many discussed their involvement in wheelchair sport, including rugby, sledge hockey, and shooting. Others mentioned positive experiences with leisure physical activity, including hand-cycling, kayaking, or sailing. Participants reported engaging in these activities in order to improve health and build strength. Others engaged in physical activity to provide focus and relieve stress. In some cases, wheelchair sport also included opportunities for travel. An emphasized benefit was added peer support, which provided learning opportunities for adapting to injury. Barriers to participating in physical activity included the cost of the equipment, lack of accessible equipment at fitness facilities, living in a rural area where activities are not offered, and difficulties with the built-environment. Neuropathic pain was a barrier to both physical activity and peer support. Conclusions: Much like the general population, persons with tSCI report engaging in structured and unstructured physical activity do so to improve their health and mental wellness. However, engagement in physical activity also facilitates peer support. Further research is needed to test interventions to increase physical activity. Key words: spinal cord injuries, exercise, peer group.

PMR – 120
NEEDS AND HEALTHCARE UTILIZATION IN SPINAL CORD INJURY: A COMPARISON OF SASKATCHEWAN AND NATIONAL FINDINGS FROM THE SPINAL CORD INJURY COMMUNITY SURVEY
Gary Linassi1, Marla Rogers1, Luc Noreau2, Darren Nickel1, Katherine Knox1, Donna Goodridge1, Laura Klassen1, Bonnie Jeffery1, Arlene Brandt1, Daryl Fourney1, Hyun Lim1
1University of Saskatchewan, 2University of Regina, 3Saskatoon Health Region

Objective: To describe needs and healthcare utilization of those with traumatic spinal cord injury (tSCI) living in Saskatchewan (SK), and compare to the rest of Canada. Design: Online survey. Setting: Canada. Participants: Saskatchewan and rest of Canada tSCI adults. Outcome Measures: National Spinal Cord Injury Community Survey. Results: Respondents from SK did not differ significantly from those across Canada in terms of age, gender, ethnicity, or living arrangements. There were more...
transportation-related injuries in SK (65% vs. 53%, p = 0.009). For all respondents, the most important needs identified were equipment/technologies, accessible housing and income support. More SK respondents had their equipment/technology needs (50% vs. 31%, p = 0.014) and their accessible housing needs (50% vs. 45%, p = 0.001) completely met. Fewer SK respondents placed high importance on SCI-specialized and general healthcare (p < 0.001). About one quarter of respondents from SK (26%) and beyond (27%) indicated that there was a time they felt they needed care in the past 12 months but either did not access or receive it. The most commonly accessed healthcare providers were family physicians and occupational therapists for all respondents. Those from outside of SK accessed urologists (p = 0.037) and wound care specialists (p = 0.010) more than SK participants. From SK, a ‘wallet list’ was used by more respondents than the rest of the country. There were some differences between those in Saskatchewan versus the rest of Canada, it is clear that many adults with tSCI have unmet needs and that the systems addressing those needs have room for improvement. Key words: spinal cord injuries, utilization, needs assessment.

PMR – 121 AWARD WINNER
IMPACT OF INCREASED PROSTHETIC WEIGHT ON GAIT SYMMETRY IN DYSEVASCULAR TRANSFEMORAL AMPUTEES: A RANDOMIZED PROSPECTIVE DOUBLE-BLIND CROSSOVER TRIAL
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Context: The trend in the prosthetic industry is towards the use of lightweight prostheses. Lighter components are more expensive, however, a lighter prosthetic does not improve the metabolic cost of ambulation for a transfemoral amputee. One study showed more than half of participants preferred a weighted prosthesis, with no adverse effect on self-selected walking speed. Objective: The purpose of this study was to determine the impact of increased prosthetic weight on gait symmetry, as well as weight preference, in dysvascular transfemoral amputees when comparing across three mass conditions. Design: A randomized prospective double-blind crossover trial. Setting: A university affiliated community rehabilitation hospital. Participants: Ten dysvascular unilateral transfemoral amputees. Intervention: Three visually identical weights of 150 g (placebo weight), 770 g, and 1,625 g were added independently to each participant’s prosthesis. Outcome Measures: Gait asymmetry was assessed using the GAITRite walkway, and subject preference for each participant’s prosthesis was assessed using the GAITRite spatiotemporal measures showed no differences associated with mass conditions. Design: A randomized prospective double-blind crossover trial. Setting: A university affiliated community rehabilitation hospital. Participants: Ten dysvascular unilateral transfemoral amputees. Intervention: Three visually identical weights of 150 g (placebo weight), 770 g, and 1,625 g were added independently to each participant’s prosthesis. Outcome Measures: Gait asymmetry was assessed using the GAITRite walkway, and subject preference for each participant’s prosthesis was assessed using a wallet list. While these results are similar to those of previous studies, they differ in that participants preferred a heavier prosthesis. These results do not support a shift towards lighter prostheses in dysvascular transfemoral amputees. Key words: prostheses, implants, gait.

PMR – 122
PILOT TESTING OF AN ELECTRONIC TABLET WAITING ROOM QUESTIONNAIRE FOR PEOPLE WITH AMPUTATIONS
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Context: There are advantages to using electronic data collection for patient care, program review, and research. Comorbidities causing sensory, visual, and cognitive impairment are common among people with amputations, and may present some unique challenges to the use of technology in a tablet computer format. Objective: To determine the feasibility and patient comfort with a tablet-based questionnaire in an outpatient amputee rehabilitation clinic compared to a traditional paper-based questionnaire. Design: convenience sample of 48 patients (age range 19–91) with major extremity amputations returning to a tertiary care centre amputee rehabilitation clinic completed both tablet and paper questionnaires, followed by a semi-structured interview. Patients had highly varied prior tablet/smartphone and internet/email experiences. Results: 20.5% of patients needed hands-on assistance completing the paper questionnaire compared to 20.8% for the tablet. Age was positively correlated with completion times of both the tablet (r = 0.588, p = 0.001) and paper (r = 0.525, p = 0.001) questionnaires. No gender differences were found in any of the studied parameters. Only 1 person indicated that he/she was uncomfortable with the use of a tablet in future visits. Conclusions: This pilot study of electronic tablet-based questionnaires demonstrates excellent acceptance by patients with amputations in an outpatient clinic setting. While there were differences in the questionnaires used, patients reported a preference for using tablets. Assistance rates were identical for both tablet and paper. Tablet use for patient questionnaires poses significant advantages over paper questionnaires and should be further explored. Key words: amputees, computers, questionnaires.

PMR – 123
ANALYSIS OF CANADIAN PHYSICAL MEDICINE AND REHABILITATION SPECIALISTS
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These are the results of an online survey for practicing physical medicine and rehabilitation (PM&R) specialists. In this survey many domains of practice were assessed both clinical and administrative. There are an estimated 385 physiatrists practicing in Canada. This survey was begun by 168 and completed by 119. Seventy-nine percent were in full-time practice. Sixty percent were male. Fifty percent had completed a fellowship and 94% had passed the Royal College of Physicians and Surgeons of Canada PM&R examination. Electrodiagnostic medicine (EMG) certification was achieved in 20.5% of patients. There are advantages to using electronic data collection for patient care, program review, and research. Comorbidities causing sensory, visual, and cognitive impairment are common among people with amputations, and may present some unique challenges to the use of technology in a tablet computer format. Objective: To determine the feasibility and patient comfort with a tablet-based questionnaire in an outpatient amputee rehabilitation clinic compared to a traditional paper-based questionnaire. Design: Convenience sample of 48 patients (age range 19–91) with major extremity amputations returning to a tertiary care centre amputee rehabilitation clinic completed both tablet and paper questionnaires, followed by a semi-structured interview. Patients had highly varied prior tablet/smartphone and internet/email experiences. Results: 20.5% of patients needed hands-on assistance completing the paper questionnaire compared to 20.8% for the tablet. Age was positively correlated with completion times of both the tablet (r = 0.588, p = 0.001) and paper (r = 0.525, p = 0.001) questionnaires. No gender differences were found in any of the studied parameters. Only 1 person indicated that he/she was uncomfortable with the use of a tablet in future visits. Conclusions: This pilot study of electronic tablet-based questionnaires demonstrates excellent acceptance by patients with amputations in an outpatient clinic setting. While there were differences in the questionnaires used, patients reported a preference for using tablets. Assistance rates were identical for both tablet and paper. Tablet use for patient questionnaires poses significant advantages over paper questionnaires and should be further explored. Key words: demography, physical medicine and rehabilitation, physician’s practice patterns.

PMR – 124
IMPAIRED PERCEPTION OF ANGER AND SADNESS IN INDIVIDUALS WITH SPINAL CORD INJURIES
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Context: Numerous studies have identified emotion-specific deficits resulting from focal brain damage. Objective: The purpose of the current study was to examine whether impairments in the recognition of specific facial expressions of emotion could also result from damage to the spinal cord. Such a finding would be consistent with the view that ascending information from the body modulates emotional experiences. Design: Thirty-six individuals with complete (ASIA-A classification) spinal cord lesions and 36 matched healthy controls completed an emotion recognition test. Participants viewed photo-
graphs of faces expressing happiness, fear, sadness, anger, disgust, surprise, and no emotion, and were asked to verbally indicate which emotion was being displayed. Results: The individuals with spinal cord injuries (SCIs) were less accurate at identifying emotional expressions than were controls. Specific impairments were noted for the recognition of anger and sadness. The level of the SCI did not affect results. Conclusions: These data suggest that feedback from the body projected via the spinal cord influences the perception of some emotional expressions, and that disruption of these projections can produce emotional impairments in individuals with SCIs. Key words: spinal cord, emotions, expression.

PMR – 125

ASSESSMENT OF SEX DIFFERENCE IN BASELINE COGNITION OF ELITE ATHLETES USING THE MONTREAL COGNITIVE ASSESSMENT TOOL

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Objective: To show the feasibility of using the Montreal Cognitive Assessment Tool (MoCA) to evaluate baseline cognition in a group of elite athletes, and to compare sex difference in baseline MoCA scores in athletes participating in collision/contact sports compared to athletes in non-contact sports. Design: Baseline case series of normative data. Setting: port Medicine Clinic at the University of Calgary, Alberta, Canada. Participants: Male and female athletes (n=219 and 139, respectively) were recruited from the college, varsity and Canadian National sports teams. Standardized interviews and physical examinations (done by a physician) were performed on the athletes from football, hockey, soccer, rugby, basketball, wrestling, alpine skiing, bobsled, skeleton, luge, speed skating, field hockey, track & field and volleyball. Interventions: A baseline pre-season MoCA test was performed and biographical information gathered from participants. Outcome Measurements: The MoCA, a cognitive assessment tool, was used to assess outcome. The test is scored out of 30 points (mild cognitive impairment ≤26). Results: All subjects had an education level of grade 12 or greater. The average age was 23.4±3.4. The overall mean MoCA score for males was 26.1±2.1 and was 26.9±2.2 for females, producing a statistically significant difference (p=0.0015, Mann-Whitney U test). When independently assessing contact and non-contact sports, there was a significant difference between males and females in contact sports (p=0.016, Mann-Whitney U test). This was not the case for males vs. females in non-contact sports (p=0.1892, Mann-Whitney U test). Conclusions: The MoCA can be used to assess baseline cognition in the elite athletic population. There was a significant sex difference in all athletes and contact/collision sport athletes in baseline MoCA scores. This could be explained by males sustaining more subconcussive injury than females and anatomical or cognitive differences, however reasons for sex difference on MoCA score should be further evaluated. Key words: brain injuries, data collection, sex characteristics.

PMR – 126

EVALUATION OF THE QUALITY OF WRITTEN FEEDBACK ON CANMEDS DAILY ENCOUNTER FORMS IN PM&R RESIDENCY TRAINING

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Context: A single page “Daily Encounter Form” (DEF) was developed for our residency program in an attempt to foster reflective practice and awareness of CanMEDS competencies in clinical practice. Comments for “Strengths” and “Areas for Improvement” related to the encounter were requested for formative feedback. Design: Retrospective review of evaluations completed for PM&R residents from December 2010–December 2013. Feedback was separately coded and categorized by the authors and reviewed for agreement. The written feedback for each “Strengths” and “Areas for Improvement” were subdivided and coded to one of four quality ratings: i) none, ii) general comment, iii) specific example(s) and iv) specific suggestion(s). Results: 192 DEFs were completed from December 2010–December 2013. PM&R consultants completed 87.5% of the forms, with the remainder completed by off-service consultants, trainees or allied health members. 67.7% of the forms were discussed and signed on the day of the encounter. On average 2.2 competencies were highlighted with each encounter. Specific strengths were identified in 53.2% and general strengths in 45.8%. Regarding Areas of Improvement, 38% of the forms included a specific example or suggestion for improvement while 43.8% provided no suggestions. Conclusions: DEFs facilitate assessment of CanMEDS competencies in the clinical environment. While the ratings suggest that there are missed opportunities for providing feedback regarding areas for improvement, it is possible that specific formative feedback was provided despite not being explicitly recorded. Complete and constructive reports are encouraged as trainees may access these throughout residency for reflection and assessment of performance. Key words: postgraduate, CanMEDS, reflective practice.

PMR – 127 AWARD WINNER

MRI MORPHOMETRIC HIP COMPARISON ANALYSIS OF ANTERIOR ACETABULAR LABRAL TEARS

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Objective: Anterior (3-o’clock) acetabular labral tears (AALTs) have been reported to be associated with iliopsoas impingement (IPI). However, no study has examined the association between anatomic bony variables of the hip joint and AALTs. The purpose of this study was to evaluate the association between AALTs, femoroacetabular impingement (FAI) and other bony variables of the hip. Material and Methods: Seventy-six out of 274 hip MRI records met the inclusion criteria. Two independent blinded investigators evaluated the location of acetabular labral tears (ALTs), edema at the musculotendinous junction of the iliopsoas insertion, femoral head-neck offset, femoral head-neck shaft angle, acetabular version angle, alpha angle, lateral central edge angle (LCEA), acetabular index and acetabular depth. Comparison analyses between groups were performed. Results: Twenty-two patients had no ALTs (controls), 19 patients had AALTs, and 35 patients had ALTs not isolated at the 3-o’clock position (25 with cam-bony deformities [FAI-Cam] and 10 with pincer-bony deformities [FAI-Pincer]). The alpha angle mean was significantly higher (p<0.001) in FAI-Cam group (62.7º, 95% confidence interval [CI]: 56.2º–69.2º) compared to AALTs group (46.9º, 95% CI: 40.1º–53.7º). The LCEA mean was significantly higher (p<0.001) in FAI-Pincer group (41.9º, 95% CI: 39.3º–44.5º) compared to AALTs group (29.4º, 95% CI: 24.2º–34.6º). There was no statistically significant difference in any of the bony variables between the controls and AALTs group. Conclusion: Our study demonstrated that AALTs are pathologically distinct and not associated with FAI or other bony abnormalities. This supports the previous studies, which proposed that AALTs are associated with IPI. Key words: magnetic resonance imaging, magnetic resonance arthrography, iliopsoas tendon, femoroacetabular, impingement.
PMR – 128
DOES IMAGING GUIDANCE IMPROVE PATIENT OUTCOME FOLLOWING CORTICOSTEROID INJECTIONS OF THE SHOULDER?

Steven Macaluso, Katherine Salter
Western University

Context: Use of corticosteroid injection is associated with small to modest short-term gain in function and pain reduction. Use of ultrasound guidance (USG) may improve accuracy of shoulder injection significantly; however, it is uncertain whether USG-guided injection is associated with improved patient outcomes. Objectives: To examine current evidence to determine whether USG-guided injection is associated with improved patient outcomes and reduced risk for adverse events compared to landmark-guided injection. Method: Multiple electronic databases were searched (January 2008–June 2013). Searches were limited to previously-published systematic reviews and meta-analyses examining the use of USG-guided injection and including the assessment of pain and function. The AMSTAR tool was used to assess methodological quality of included reviews. Results: Following removal of duplicates, 4 systematic reviews (3 meta-analyses) were identified for inclusion. AMSTAR scores ranged from 5 to 9. The most recent meta-analyses identified ≤6 studies (≤3 RCTs) evaluating the impact of accuracy on patient outcomes. Pooled analyses demonstrated a small reduction in pain associated with USG (6-weeks post-injection); however, these analyses were statistically heterogeneous. Compared to landmark guidance, USG injection was not associated with clinically significant improvements in function or range of motion. There were no significant between group differences in adverse events noted. Conclusions: There have been few well-designed RCTs that examine the impact of increased injection accuracy on patient outcomes and reviews report little information regarding the use of specific techniques and/or approaches that may influence clinical effectiveness. Further investigation is warranted. Key words: injection, corticosteroid, shoulder.

PMR – 129 AWARD WINNER
NUTRITIONAL SUPPLEMENTATION FOR KNEE OSTEOARTHRITIS

Steven Macaluso, Katherine Salter, Ranita Manocha, Cristina Batey
Western University

Context: Osteoarthritis (OA) of the knee is a common condition which has considerable impact on patients’ quality of life and function. There is increasing interest by patients in the use of nutritional supplements. We looked at the research to see if there is any evidence of beneficial effects on pain or function.

Methods: Relevance and quality of data in favour of glucosamine and avocado-soybean for reduction of pain. Data on collagen derivatives, DMSO/MSM and S-Adenosylmethionine comes from poor quality limited evidence. Key words: osteoarthritis, supplement, nutrition.

PMR – 130
CLINICAL REVIEW OF ACUPUNCTURE FOR NON-TRAUMATIC SHOULDER PAIN

Steven Macaluso, Ranita Manocha, Katherine Salter, Cristina Batey
Western University

Context: Non-traumatic shoulder pain is a common problem that can result in significant morbidity. Common etiologies include rotator cuff dysfunction, glenohumeral osteoarthritis, and adhesive capsulitis. Acupuncture is increasingly being used in musculoskeletal conditions to improve pain and function. We review the quality and outcomes of systematic reviews addressing acupuncture for non-traumatic shoulder pain.

Methods: Relevant systematic reviews in English published 2008–2013 were extracted from PubMed, SCOPUS, and Web of Science databases. Articles were assessed for methodological quality using the 11-item AMSTAR system by two independent reviewers. Based on research quality, strength of results and clinical availability, the intervention was then assigned a level of recommendation. Results: Four (4) systematic reviews met the inclusion criteria and addressed acupuncture for pain, range of movement, and function. AMSTAR scores ranged from 5 to 9.5 out of 11. Overall acupuncture may be beneficial for shoulder pain but may not improve range of motion or function at 6 months. Conclusions: Although the quality of most studies of acupuncture for shoulder pain are poor, there are several systematic reviews of moderate quality. While the evidence is not strong it favours acupuncture having a small benefit on non-traumatic shoulder pain.

Key words: acupuncture therapy, review, systematic, shoulder pain.

PMR – 131
TOILETING: A NEGLECTED TOPIC IN ADULT REHABILITATION POPULATIONS. A CLINICAL REVIEW

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Context: The ability to toilet independently is critical to dignity and self-esteem. Rehabilitation patients’ reduced balance and arm mobility can impair their ability to safely and independently toilet themselves – i.e., defecate, urinate and clean the perianal/urethral regions. Discharge home after a rehabilitation stay may depend on the ability to perform these functions independently. The purpose of this review was to synthesize the available information on toileting in rehabilitation populations and identify gaps in research concerning this neglected area.

Methods: The following databases were searched for articles on toileting in adult rehabilitation populations: Cochrane Library, AgeLine, CPIQ, CINAHL, Medline and PubMed.

Results: Studies on toileting were found in populations with chronic low-back pain, hip fracture, rheumatoid arthritis, amputation, multiple sclerosis, stroke, traumatic brain injury, Parkinson’s disease, spinal cord injury and dementia. The review was divided into 1) causes of toileting impairment (physical vs. cognitive disability) (17 studies), 2) measurement of toileting performance (degree of cleanliness, need for assistive devices) (8 studies), 3) consequences of impairment (7 studies) and 4) interventions to enhance toileting independence (5 studies). Physical disabilities predominated over analysis. S-Adenosylmethionine had a non-significant impact on pain or function. Conclusions: There is a wide range in the quality of data for nutritional supplements for knee OA, with most high quality data in favour of glucosamine and avocado-soybean for reduction of pain. Data on collagen derivatives, DMSO/MSM and S-Adenosylmethionine comes from poor quality limited evidence. Key words: osteoarthritis, supplement, nutrition.
cognitive ones. No dedicated measures for toileting were found, but the FIM, a universally accepted measure of burden of care, has a toileting component. Both patients and health care professionals are embarrassed to discuss toileting, and affected patients feel distress and loss of dignity. Conclusions: Although toileting impairment is a barrier to achieving independence, the rehabilitation literature on this topic is sparse. Currently available technologies may be effective toileting adjuncts. Key words: toileting, rehabilitation, disability.

CASE REPORTS

PMR – 132
TRANSHUMERAL AMPUTATION FOR COMPLEX REGIONAL PAIN SYNDROME-TYPE 2: CASE REPORT
Kshitij Chawla, Amarjit Arneja
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Context: There is lack of evidence regarding the benefits, patient outcomes and recurrence in patients with Complex Regional Pain Syndrome (CRPS) undergoing amputation. Patients with long-standing and therapy resistant CRPS may find benefit from amputation but recurrence risk is still reported high. Findings: A 44-year-old man involved in motor vehicle accident sustained open comminuted fractures of left radius and ulna. Few weeks after surgical management of the fractures he reported constant burning pain through left arm, grading 10/10 on verbal Numeric Rating Scale. Physical examination revealed edema, erythema, and changes in nail and hair growth patterns. Decreased passive ROM in all directions at wrist and elbow. There was numbness over the ulnar aspect of forearm and hand. Wrist extension <3/5. MCP extension <3/5. Flicker with finger abduction. Electro diagnostic study concluded severe injuries to ulnar and radial nerve below the elbow. After consultation with Pain clinic and Physiatry, he was diagnosed with CRPS Type 2. Multiple treatment options were discussed, including neuopathic pain medications, physiotherapy and interventional blocks. High risk of recurrence with amputation was explained. However, the patient insisted on amputation and after consult with Plastic Surgery he underwent transhumeral amputation. The patient persisted to have CRPS and severe limb pain and did not tolerate prosthesis. Conclusion/Relevance: The patient underwent amputation within 5 months of being diagnosed with CRPS type-2 and refused any conservative treatments. His symptoms continued to persist resulting in a difficult rehabilitation course. Key words: causalgia, complex regional pain syndromes, amputation.

PMR – 133
RADIATION-INDUCED MYELOPATHY AND AUTONOMIC FAILURE
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Mayo Clinic

Context: Clinical, radiographic, and autonomic nervous system test findings are described in a case of progressive autonomic failure resulting from a radiation-induced cervico-thoracic myelopathy. Findings: A 22-year-old female was referred to our institution for evaluation of progressive autonomic failure. She was diagnosed 3 years prior with thoracic region Hodgkin lymphoma; treated initially with chemotherapy, followed by autologous stem cell transplantation, and ultimately externally beam radiation to the neck and chest. Several months later she developed ascending lower limb numbness and weakness, eventually becoming paraparetic. MRI studies demonstrated extensive, confluent T2 signal change involving the cervical and thoracic spinal cord, and ultimately she was diagnosed with a radiation-induced myelopathy. Several months later she developed recurrent syncope and near-syncope, and a pacemaker was placed without benefit. Her neurological examination revealed a spastic paraparesis with a T4 sensory level. Autonomic testing revealed intact postganglionic sympathetic sudomotor function, marked cardiovascular impairment, and cardiovascular adrenergic failure with orthostatic hypotension on tilt-table testing. Symptomatic stabilization was achieved following the initiation of fludrocortisone and midodrine. Conclusion/Relevance: Myelopathy is an uncommon complication of radiation to the neck and thorax. Progressive autonomic dysfunction, resulting in cardiovascular, genitourinary, and cardiovascular adrenergic failure has not been well characterized in radiation-induced myelopathy. Timely recognition of this condition will facilitate implementation of potentially beneficial symptomatic treatment and avoidance of unnecessary diagnostic tests and treatments. Key words: myelopathy, autonomic failure, radiation.

PMR – 134
PROPRIOCEPTIVE BRACING DURING INPATIENT REHABILITATION FOR ATAXIA AND BALANCE IMPAIRMENT FROM OSMOTIC DEMYELINATION SYNDROME AND SENSORY NEUROPATHY: A CASE SERIES
Sogoal Kachooie1, Cristina Batey1, Michael Payne1, Leanne Brady2, Sarah Dunford2, Thomas Miller1
1Western University, 2St Joseph’s Health Care

Context: The combined effects of alcohol on the brain, cerebellum and the peripheral nervous system result in similar functional proprioceptive impairments to those seen in sensory neuropathy (gangliopathy) from Sjogren’s syndrome. Management approaches to enhance both residual proprioception and function are crucial to successful rehabilitation. We present 2 cases of ataxia due to a central etiology as well as 1 case of peripheral sensory neuropathy that benefitted from proprioceptive orthoses in a rehabilitation setting. Findings: A male age 52, and a female age 67, were admitted to inpatient rehabilitation due to complications of alcoholism. The use of lower limb proprioceptive tools, such as leg wraps, compression garments, weighted vests and weighted ankle orthoses, or a combination, resulted in significant improvement in pre and post, video gait analysis, TUG, motor FIM, and Berg Balance Scale. A third case of sensory gangliopathy in a 62 year old female, also noted significant improvement in outcomes, following similar rehabilitation interventions, in TUG, 2 minute walk test, Berg Balance Scale, as well as transfers and toileting as measured by the motor FIM. In all 3 cases proprioceptive bracing and a weighted vest were used to improve gait, transfers, balance scores and confidence in mobility during inpatient rehabilitation. Conclusion/Relevance: The novel use of proprioceptive bracing, weighted vests, and weighted ankle orthoses, provide additional afferent input and should be considered as a treatment option of both centrally and peripherally induced ataxia and balance challenges to improve function. Key words: alcoholism, Sjogren’s syndrome, proprioception.

PMR – 135
PERI-INCISIONAL BOTULINUM TOXIN FOR CHRONIC POST CRANIOTOMY HEADACHE FOLLOWING TRAUMATIC BRAIN INJURY: A CASE SERIES

J Rehabil Med 46
Context: Botulinum toxin (BTX) has traditionally been used to treat conditions of pathologically increased muscle tone. However, the observed clinical benefit of BTX cannot be fully explained by the anticholinergic effect it is known to have at the presynaptic terminal of the neuromuscular junction. BTX has been used successfully for the management of primary headache syndromes but there is no published data on its use for the treatment of chronic post craniotomy headache (PCH) following neurosurgical intervention for traumatic brain injury (TBI). Findings: We present three patients managed surgically for post-traumatic epidural hematomas who developed chronic headaches with focal peri-incisional pain as the predominant feature. Two patients used topical liniment containing lidocaine, ketoprofen, and amitriptyline with minimal benefit. Oral medications resulted in side effects and/or inadequate analgesia. BTX (4:1 dilution, total dose of 20–50 units) was injected into multiple peri-incisional sites of the scalp. Two of the three patients also received injections into the cranial musculature. All patients reported reductions in headache pain and scar sensitivity lasting at least two months. Repeat injections were performed with favourable outcomes in all three cases. There were no complications. Conclusion/Relevance: While the exact mechanism of action remains unclear, peri-incisional BTX appears to be a valuable tool in the chronic management of PCH following TBI. Oral analgesics rely heavily on patient compliance for their effectiveness and their use is frequently limited by systemic side effects. Furthermore they can lead to medication-induced headaches thereby worsening the clinical picture. Key words: botulinum toxins, brain injuries, craniotomy, secondary headache disorders.

PMR – 136
FROM WHEELCHAIR TO CANE: ELECTIVE TRANSTIBIAL AMPUTATIONS IN A PATIENT WITH L4 SPINA BIFIDA
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1Sunnybrook Health Sciences Centre, St. John’s Rehab, 2Sunnybrook Health Sciences Centre

Context: Myelomeningocele, a form of congenital spina bifida, is associated with lower extremity weakness, sensory loss, impaired bowel/bladder function and obstructive hydrocephalus. Patients with lower lumbar and sacral levels of spina bifida are mostly ambulatory through to adolescence and some into adulthood. They have increased risk for foot deformities, osteoarthritis, ulcers and osteomyelitis. Many become non-ambulatory as adults, due to these complications and obesity. Findings: A 27-year-old female with Spina Bifida (L4 level), ambulated with bilateral AFOs and canes until late adolescence. She then developed bilateral subtalar arthritides, chronic foot ulcerations and osteomyelitis. From age 21 to 26 years, she required multiple foot surgeries and IV antibiotics. From age 25, she used a wheelchair and scooter. The patient, frustrated with repeated surgeries, hospitalizations, and loss of ambulation decided on amputations versus further foot reconstruction. The patient underwent elective transtibial amputations, 2 months apart. She was fitted with bilateral transtibial prostheses with Vario-flex feet 4 weeks post second amputation. After 4 months of intensive rehabilitation, she ambulated with a cane. Her Houghton score of prosthetic use was 7 out of 9 with no feelings of instability. Her L-test of functional mobility was 27 seconds. The patient felt her quality of life had improved. Conclusion/Relevance: This young, non-obese patient had her ambulation and quality of life restored with bilateral transtibial amputations. Despite a negative prognostic indicator of poor mobility pre-amputation; transtibial amputation should be considered for lower level spina bifida patients with chronic foot osteomyelitis. Key words: transtibial, amputee, myelomeningocele.
carotid stenosis resulted in ischaemia of this watershed area resulting in isolated shoulder weakness. These ischaemic strokes are called ‘watershed’ or ‘hemodynamic’ infarcts. Prompt identification by CT angiogram or Carotid Doppler Ultrasound is necessary for definitive and timely treatment and prevention of future disabling strokes. Key words: carotid stenosis, weakness, watershed infarct.

PMR – 139 AWARD WINNER
MONONEURITIS MULTIPLEX IN GRAFT VERSUS HOST DISEASE: A CASE REPORT
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Context: Graft versus host disease (GVHD) is a common complication of hematopoietic stem cell transplantation (HSCT). It is characterized by immune-mediated multisystemic inflammation due to donor T-cells attacking mismatched recipient antigens. It has been associated with a variety of neuromuscular complications. There are a few case reports of mononeuritis multiplex. One describes a pediatric patient with severe GVHD developing a peroneal neuropathy and meralgia paresthetica, without clarification of pathophysiologic mechanisms. Chronic GVHD resulting in sclerodermoid skin changes and entrapment neuropathies secondary to skin sclerosis has been described on a few occasions.

Findings: A 49-year-old man with chronic lymphocytic leukemia received an allogeneic HSCT, complicated by acute GVHD. Four months later he developed a left foot drop and shortly afterwards, left thumb extension weakness. On examination he had profound weakness of extensor digitorum brevis and longus (grade 2/5) and of left dorsiflexion, ankle eversion, great toe extension (1/5), and ankle inversion (3/5). Other posterior interosseous nerve (PIN) muscles were normal. Nerve conduction studies showed reduced radial CMAP amplitude and no recordable peroneal motor response from extensor digitorum brevis. Needle electromyography showed active denervation and reinnervation in extensor pollicis longus and brevis, tibialis anterior and tibialis posterior. MRI did not support an L5 radiculopathy. These findings were consistent with mononeuritis multiplex involving a branch of the left posterior interosseous and sciatic nerves. Conclusions/Relevance: Mononeuritis multiplex is a rare but recognized complication of GVHD. We present a case not due to skin sclerosis with nerve entrapment. Key words: graft vs host disease, hematopoietic stem cell transplantation, mononeuropathies.

PMR – 140
AID KINETICS DURING FOREARM CRUTCH ASSISTED GAIT IN A TRANSPELVIC AMPUTEE
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1Western University; 2University of British Columbia

Context: Transpelvic amputations are the least commonly performed lower extremity amputation. As prosthetic gait in this population has high energy costs, most transpelvic amputees use forearm crutches in a swing-through gait pattern. No studies have been published on the kinetics of this gait pattern in this population. This study illustrates crutch ground reaction force profiles for a 56-year-old transpelvic amputee using three commercially available forearm crutch designs. Findings: Across the 3 crutch types, average vertical ground reaction forces were approximately 40% body weight (BW). Average forces in the braking, propulsive, and lateral directions were 5% BW. Crutch C, which had a spring-like polymer in the shaft and a ball-and-socket foot exhibited the lowest mean braking and lateral ground reaction forces. Kinetics were asymmetric between the left and right sides. Conclusion/Relevance: This case highlights general features of swing-through gait kinetics in a transpelvic amputee, contributing to the paucity of literature in this area. Different elements of crutch design such as shaft material and tip configuration could contribute to altered kinetics. Asymmetric weight distribution following such an amputation may also be an important consideration. Additional basic science and clinical research is needed to guide crutch design and ultimately prescription to meet an individual patient’s needs. Key words: crutches, equipment design, hemipelvectomy.

PMR – 141
CORTICOSTEROIDS AS AN AFFECTIVE DISEASE MODIFYING TREATMENT OF INFLAMMATORY COMPLEX REGIONAL PAIN SYNDROME IN THE UPPER LIMB: A CASE SERIES
Paul Winston
Island Health Authority, University of British Columbia, University of Victoria

Context: Despite over a hundred years of definitions, names and controversy, Complex Regional Pain Syndrome (CRPS) remains a debated diagnosis with multiple treatments, and philosophies. Failure to treat acutely may result in lifelong pain, loss of function; even amputation. Unemployment and prolonged disability is common. Pharmacologic treatment varies by institutional preference and lacks consensus. Oral corticosteroids have been studied in very few trials, but are the only pharmacologic treatment with level 1 evidence. Acute CRPS was assessed in patients with antecedent trauma or neurologic injury with the pertinent findings of a painful, unilateral hot and swollen hand and wrist, sudomotor changes, swollen hands, capsular thickening of joints and severe loss of range of motion in multiple joints of the hand, wrist or shoulder. Findings: Clinical practice has demonstrated dramatic disease altering affects and even resolution and cure of CRPS when offered early in the course of the disease. Conclusion/Relevance: This case series addresses patients presenting with CRPS in the upper extremities after neck or arm fracture or neurologic injury. Treatment with oral prednisone resulted in a dramatic decrease in pain and/or increase in function and range of motion. Key words: complex regional pain syndrome, corticosteroids, causalgia.
PMR – 143 AWARD WINNER
THE IMPACT OF PHYSIATRY-LED MUSCULOSKELETAL (MSK) CLINICAL SKILLS WORKSHOPS ON MEDICAL STUDENTS: AN OBSERVATIONAL STUDY
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Context: CaRMS (Canadian Resident Matching Service) reports indicate that fewer medical students select Physiatry as a career choice compared to other specialties. In addition, studies have shown that medical students have low confidence in musculoskeletal (MSK) clinical skills, an area of Physiatry expertise. Objective: This study will determine if: 1) medical students’ interest in Physiatry can be increased by extra-curricular Physiatry-led MSK clinical skills workshops; 2) workshops improve students’ MSK skills, measured by their self-rated confidence and Objective Structured Clinical Exam (OSCE) performance. Design: Observational Study. Setting: Faculty of Medicine, University of Toronto Participants: 80–90 second-year medical students. Interventions: Students participate in two 3-hour interactive workshops led by Physiatry faculty/residents that focus on physical examination of the upper and lower limb joints. Outcome measures: 1) Participants’ interest in Physiatry and self-rated confidence in MSK Clinical Skills by surveying before, immediately after and 9 month post-workshop. Surveys use the Likert scale (1–5). 2) Comparison of participants’ MSK OSCE station(s) average score with that of the remainder of the class. Results: Results from the pilot 2013 workshops showed that over 85% of attendees found their confidence in MSK clinical skills improved. In the current study, pre and post-workshop surveys and MSK OSCE scores will provide further evidence whether the workshops meet their objectives. Conclusions: Physiatry-led extra-curricular MSK clinical skills workshops may be a novel way to enhance interest in Physiatry, and simultaneously, may help improve medical students’ MSK Clinical Skills. Key words: career choice, education, medical, undergraduate, physical and rehabilitation medicine.

PMR – 144
INTEGRATING PHYSICAL MEDICINE AND REHABILITATION INTO THE MEDICAL SCHOOL CURRICULUM: A REVIEW OF THE LITERATURE AND RESTRUCTURING OF THE UNIVERSITY OF MANITOBA UNDERGRADUATE PROGRAM
Jennifer Salter
University of Manitoba

The principles of Physical Medicine and Rehabilitation (PM&R) are an integral part of many medical and surgical specialties. Their importance will continue to rise as the population ages and the prevalence of chronic and disabling conditions increases. Unfortunately physicians and medical students are often unfamiliar with the specialty and have insufficient knowledge about the problems individuals with disabilities face. This may be due to the poor representation of PM&R in medical school curriculums. Although musculoskeletal medicine is included in most programs there is rarely a focus on the other components of PM&R such as understanding the consequences of illness on function. Research has shown that patient care, attitude towards teamwork and the interdisciplinary team, and clinical skills can be optimized by including principles of PM&R in the undergraduate program. The University of Manitoba is completely restructuring the medical school curriculum, integrating PM&R throughout the four years of training. Concepts such as spiral of learning and longitudinal themes incorporate key elements of the specialty. Additionally, PM&R has been introduced in conjunction with other relevant specialties to allow rehabilitation to be seen in context. Clerkship changes include an interactive session with a multi-disciplinary team and a PM&R core rotation. These changes are designed to increase students’ knowledge of the specialty, increase academic opportunities for medical students, and improve the quality of referrals. This poster will review the literature on teaching PM&R to medical students and highlight key aspects of the new University of Manitoba medical school curriculum. Key words: student, medical, education, physical medicine and rehabilitation.

PMR – MEDICAL STUDENT ESSAY CONTEST AWARD RECIPIENT
CHALLENGES FOR PHYSICALLY DISABLED POPULATIONS IN LOW-INCOME COUNTRIES
Jordan Farag
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Physically disabled individuals in low-income countries have poorer access to healthcare services and overall lower quality of life compared to non-disabled individuals. The International Classification of Functioning, Disability and Health (ICF) serves as an excellent framework to examine the medical and sociocultural components of disability at both individual and population levels. The purpose of this paper is to highlight 3 major barriers to rehabilitative healthcare services for physically disabled populations in low-resource settings. These include: discrimination, poverty, and inadequate healthcare systems. To achieve this, a case study is presented, exploring the disability experience of a child with muscular dystrophy in rural Tanzania. The case study is discussed in the context of the ICF framework. Furthermore, we review literature in the field of disability, as it relates to discrimination, poverty and healthcare systems. Ultimately, we conclude that the plight of disabled individuals living in low-resource settings will persist, unless its root causes are addressed at a population level. This requires collaboration of government, healthcare workers and disabled individuals themselves, as well as respect for the basic human rights of those with disabilities. Key words: disability, global health, rehabilitation.

PMR – 145 RESIDENT ESSAY CONTEST AWARD WINNER
SYMPATHETIC SKIN RESPONSES AND AUTOMATIC DYSFUNCTION IN SPINAL CORD INJURY
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Sympathetic skin responses (SSRs) are a measure of sympathetic cholinergic sudomotor function that has been used in the assessment of autonomic dysfunction in patients with spinal cord injury (SCI). This review highlights the basic mechanisms underlying SSRs as well as its application to the SCI population. We address the utility of SSRs in assessing autonomic function, the relationship between autonomic and sensorimotor impairment and the association between SSRs and the sequelae of autonomic dysfunction in SCI (in particular autonomic dysreflexia and orthostatic hypotension). Overall, SSRs are a rapid, non-invasive and reliable method illustrating that the severity of autonomic impairment can be independent from sensorimotor impairment. We suggest that SSRs be used in...
PMR – 146 STUDENT RESEARCH AWARD WINNER

A NOVEL WAY OF DETECTING INTRATHecal BACLOFEN WITHDRAWAL IN POST-OPERATIVE PATIENTS

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Objectives: To create and test a screening tool for intrathecal baclofen (ITB) withdrawal that is convenient and usable for a broad range of healthcare providers. Design: Single center cohort study. Participants: Retrospective cohort of 33 consecutive patients (median age: 14 year; range 8 to 21) with a baclofen pump who underwent spinal fusion for neuroscoliosis or another event that put them at risk for interruption of delivery of ITB. Three (9.1%) had confirmed ITB withdrawal. Methods: We consulted the literature and clinicians with expertise in ITB withdrawal syndrome. After compiling this knowledge into a scorecard, we achieved consensus from clinicians. Once IRB approval was obtained, we tested the tool on participants. Results: The ITB Withdrawal Scorecard included the major signs of withdrawal, including pruritis, hypotension or hypertension, tachycardia, hyperthermia, agitation, hallucinations, insomnia, clonus, and seizures. The ITB Withdrawal Scorecard had 100% sensitivity, 86.7% specificity, 42.9% positive predictive value, and 100% negative predictive value. Conclusions: Despite compromised survival, patients with MSCC make clinically significant functional gains and exhibit favourable discharge outcomes following inpatient rehabilitation, but not to the extent of NT-SCI patients. Unique survival related prognostic factors and timelines for accrual of FIM gains in the MSCC population warrant discussion with MSCC patients considering inpatient rehabilitation. Key words: population, rehabilitation, spinal cord compression, spinal cord neoplasms.

PMR – 148 STUDENT RESEARCH AWARD WINNER – 2

THE INFLUENCE OF DIAGNOSTIC TERMINOLOGY ON PARENTS’ PERCEPTION OF SEVERITY FOLLOWING PEDIATRIC MILD TRAUMATIC BRAIN INJURY OR CONCUSSION

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Objective: Determine the impact of diagnostic terminology on parents’ perception of their child’s need to rest and willingness to advocate for conservative return-to-play (RTP) following pediatric mild traumatic brain injury (mTBI) or concussion. Design: Cross-sectional survey. Setting: Summer ice hockey camps. Participants: 1425 parents of pediatric ice hockey players. Interventions: Subjects were randomly administered one of three clinical scenarios in questionnaire form. The scenarios described a typical sports-related concussion/mTBI and were identical except for the diagnosis: 1) concussion, 2) mTBI; and 3) concussion, which is a form of mTBI (con-mTBI). Parents indicated how long they felt their child should wait before RTP, given the diagnosis provided. Outcome Measures: The number of days parents felt their child should rest before RTP. The proportions of conservative (>14 days) responses were compared between the groups with different diagnostic terms using a difference in proportions measure with 95% confidence intervals. Results: The proportion of parents having conservative RTP expectations for each diagnosis was: concussion (34.9%), mTBI (45.7%), and con-mTBI (41.3%). The difference in proportions was significant for concussion vs. mTBI (95%CI=4%,17%) and concussion vs. con-mTBI (95%CI=0.1%,13%), but not for mTBI vs. con-mTBI (95%CI=–2%,11%). Conclusions: Diagnostic terminology impacts parents’ perception of concussion/mTBI severity. Utilizing the term mTBI, with or without the term concussion, encourages more cautious RTP expectations. We must carefully consider the influence of diagnostic terminology when discussing RTP guidelines following concussion/ mTBI. Key words: concussion, children, ice hockey, head injuries.

PMR – 147 RESIDENT RESEARCH AWARD WINNER – 1

INPATIENT REHABILITATION LENGTH OF STAY AND SURVIVAL FOLLOWING MALIGNANT SPINAL CORD COMPRESSION: IS IT WORTH IT?

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Context/Objective: Malignant spinal cord compression (MSCC) leads to significant disability and limited survival. We sought to compare demographic characteristics and clinical outcomes of patients admitted for inpatient rehabilitation following MSCC versus other etiologies of non-traumatic spinal cord injury (NT-SCI). Design: Retrospective cohort study, using administrative data sets held securely in a linked, de-identified form and analyzed at the Institute for Clinical Evaluative Sciences (ICES). Setting: Ontario rehabilitation facilities (n=59). Participants: Adults admitted for rehabilitation following incident diagnoses of MSCC (N=144) or NT-SCI (n=1283) from April 2007 to March 2011. Outcome Measures: Demographic and impairment characteristics, Functional Independence Measure (FIM), discharge destination, goal attainment, length of stay (LOS), and survival. Results: The mean total FIM change in the MSCC cohort was 20.2±14.22, (p<0.001). The NT-SCI cohort had greater FIM gains (24.0±14.44, p=0.006) and FIM efficiency than the MSCC cohort (1.2±1.73 vs. 0.76±0.76, p<0.001). A majority (65.3%) of the MSCC cohort were discharged home and met their rehabilitation goals (75.3 %), rates comparable to NT-SCI (69.8% and 81.9%). Three-month, 1-year, and 3-year survival rates in the MSCC and NT-SCI cohorts were 76.4% versus 97.0%, 46.5% versus 93.5%, and 27.8% versus 86.8%, respectively. Conclusions: Despite compromised survival, patients with MSCC make clinically significant functional gains and exhibit favourable discharge outcomes following inpatient rehabilitation, but not to the extent of NT-SCI patients. Unique survival related prognostic factors and timelines for accrual of FIM gains in the MSCC population warrant discussion with MSCC patients considering inpatient rehabilitation. Key words: population, rehabilitation, spinal cord compression, spinal cord neoplasms.

PMR – 149 RESIDENT RESEARCH AWARD WINNER – 3

GOING PLACES: DOES THE TWO-MINUTE WALK TEST PREDICT SIX MINUTE WALK TEST IN LOWER EXTREMIT AMPUTEES?

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Supported by Canadian Forces Health Services, Surgeon General Health Research Project and University of Ottawa Summer Studentship Context: Assessing a patient’s ability to walk the distances
required for community ambulation (at least 300 m) is highly important in amputee rehabilitation. During the two-minute walk test, most amputees cannot walk 300 m. For that reason, the six-minute walk test may be preferred but this is a longer test and it has not been fully validated in this population. Objective: Assessing a patient’s ability to walk the distances required for community ambulation (at least 300 m) is highly important in amputee rehabilitation. During the two-minute walk test, most amputees cannot walk 300 m. For that reason, the six-minute walk test may be preferred but this is a longer test and it has not been fully validated in this population. This study: 1) examined the convergent and discriminative validity of the six-minute walk test and 2) assessed whether the two-minute test could predict the results of the six-minute test. Methods: 86 patients with unilateral or bilateral amputations at the syme, trans-tibial, knee disarticulation or trans-femoral level completed the six-minute walk test, the two-minute walk test, the Timed Up and Go test, and completed the Locomotor Capabilities Index version 5, the Houghton scale, and the Activity-Specific Balance Confidence scale. Results: The six-minute walk test correlated strongly with the other tests (R²=0.36-0.9), demonstrating convergent validity. It demonstrated discriminative validity with respect to age, etiology of amputation, and K-level (p<0.0001). The two-minute test was highly predictive of the six-minute test distance (R²=0.91). Conclusion: The six-minute walk test is a valid measure of amputee ambulation. However, the results suggest that this longer test may not be necessary, since the two-minute walk test strongly predicts the six-minute walk test. Clinicians can save time by using the shorter test. Key words: ambulation, amputation, outcome assessment.