

# PMR BUZZ

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“If you're guided by a spirit of transparency, it forces you to operate with a spirit of ethics. Success comes from simplifying complex issues, address problems head on, be truthful and transparent. If you open yourself up to scrutiny, it forces you to a higher standard. I believe you should deliver on your promise. Promise responsibly.”

# Preface

Dear Friends,

Welcome to yet another edition.

We are putting some changes by restricting ourselves to select only one article from each chosen journal, published in the previous quarter from this edition. This is an attempt to make it more comprehensive and a quick read. It had been a daunting task, as there are many more articles that you would like to talk about, but this buzz is intended just to be a cinder.

Some of the exciting works highlighted here are management of 12th rib syndrome, long term safety & efficacy of tapentadol, and spasticity management. It also highlights the ongoing challenges faced by low and middle-income countries regarding the accessibility of assistive devices, the role of telehealth and 3-D printing.

I also welcome Dr Vinay Goyal as our new contributor for PMR Buzz. We are happy to have him with our team.

Happy reading

**- Dr. Mrinal Joshi**

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# Treatment and Management of Twelfth Rib Syndrome: A Best Practices Comprehensive Review.

Ivan Urits, Nazir Noor, Nathan Fackler, Luc Fortier, Amnon A Berger, Hisham Kassem, Alan D Kaye, Marc A Colon, Sumitra Miriyala, Omar Viswanath  
Pain Physician. 2021 Jan;24(1):E45-E50.

## Abstract

### Background

Twelfth rib syndrome, or slipping of the 12th rib, is an often overlooked cause for chronic chest, back, flank, and abdominal pain from irritation of the 12th intercostal nerve. Diagnosis is clinical and follows the exclusion of other causes of pain. This syndrome is usually accompanied by long-suffering, consequent psychiatric comorbidities, and increased health care costs, which are secondary to the delayed diagnosis.

### Objectives

This manuscript is a review of twelfth rib syndrome and its management options. The review provides etiology, pathophysiology, and epidemiology of twelfth rib syndrome. Additionally, diagnosis and current options for treatment and management are presented.

### Study design

This is a narrative review of twelfth rib syndrome.

### Setting

A database review.

### Methods

A PubMed search was conducted to ascertain seminal literature regarding twelfth rib syndrome.

## Results

Conservative treatment is usually the first line, including local heat or ice packs, rest, and oral over-the-counter analgesics. Transcutaneous stimulation and 12th intercostal nerve cryotherapy have also been described with some success. Nerve blocks can additionally be tried and are usually effective in the immediate term; there is a paucity of evidence to suggest long-term efficacy. Surgical removal of all or part of the 12th rib and possibly the 11th rib, as well as the next line of therapy, may provide long-lasting relief of pain.

## Limitations

Further large scale clinical studies are needed to assess the most effective management of twelfth rib syndrome.

## Conclusions

Twelfth rib syndrome is usually diagnosed late and causes significant morbidity and suffering. The actual epidemiology is unclear given the difficulty of diagnosis. Nerve blocks and surgical rib resection appear to be effective in treating this syndrome, however, further evidence is required to properly evaluate them. Familiarity with this syndrome is crucial in reaching a prompter diagnosis.

# The Tourniquet Ischemia Test in the Diagnosis of Complex Regional Pain Syndrome.

Johann Lambeck, Eva M Kesenheimer, Barbara Kleinmann, Matthias Reinhard  
Pain Pract. 2021 Mar;21(3):308-315.

## Abstract

### Background

The tourniquet ischemia test (IT) is a hitherto rarely used tool for the diagnostic work-up of patients with suspected complex regional pain syndrome (CRPS). This analysis aims to determine the sensitivity and specificity of this test, and elucidate factors that can influence the test result.

### Methods

Consecutive data on clinical presentation, results of the IT and other diagnostic tests, and clinical characteristics were analyzed from patients presenting at our autonomic laboratory between 2000 and 2011. IT results were compared with the final clinical diagnosis at discharge, and statistical analysis was performed to determine specificity, sensitivity, and positive and negative predictive values of the IT.

### Results

A total of 78 patients were assessed. IT results were positive (≥50% reduction in pain during ischemia) in 26

cases and negative in 52 cases. CRPS was the final diagnosis in 45 cases, and in 33 cases, a different diagnosis was made. This results in a test sensitivity of 49% and a specificity of 88%, with a positive predictive value of 85% and a negative predictive value of 56%. Age, sex, the type and stage of CRPS, and the affected extremity did not influence the test result in a statistically significant manner. Specificity worsened to 76% if any pain reduction was rated as a positive test result.

### Conclusions

A positive tourniquet IT has a high positive predictive value for the diagnosis of CRPS. It is thus useful as a confirmatory assay in patients with suspected CRPS. Low sensitivity rules out its use as a screening test.

### Significance

This study retrospectively analyzed the clinical significance of the tourniquet IT that was routinely used in patients with suspected CRPS. It showed that a positive IT result is useful as a confirmatory assay in patients fulfilling the clinical criteria.

# Physiotherapy interventions for the treatment of spasticity in people with spinal cord injury: a systematic review.

Paulo Henrique Ferreira de Araujo Barbosa, Joanne V Glinsky, Emerson Fachin-Martins, Lisa A Harvey  
Spinal Cord. 2021 Mar;59(3):236-247.

## Abstract

### Study design

Systematic review.

### Objective

To determine the effectiveness of physiotherapy interventions for the treatment of spasticity in people with spinal cord injuries.

### Setting

Not applicable.

### Methods

A comprehensive search was undertaken to identify all randomised controlled trials of physiotherapy interventions that included an assessor-reported (objective) or participant-reported (subjective) measure of spasticity. Only trials that provided a physiotherapy intervention on more than one occasion were included. The susceptibility to bias of each trial was rated on the PEDro scale. Data were extracted to derive mean between-group differences (95% CI) for each trial.

## Results

Twenty-eight trials were identified but only 17 provided useable data. Seven trials compared a physiotherapy intervention to no intervention (or a sham intervention) and 10 trials compared one physiotherapy intervention to another physiotherapy intervention. The median (IQR) PEDro score of the 17 trials was 6/10 (6-8). The most commonly used assessor- and participant-reported measures of spasticity were the Ashworth scale and Spinal Cord Injury Spasticity Evaluation Tool, respectively. Only one trial demonstrated a treatment effect. This trial compared continuous passive motion of the ankle to no treatment on the Ashworth scale. The remaining 16 trials were either inconclusive or indicated that the treatment was ineffective for reducing spasticity.

## Conclusions

There is no high-quality evidence to indicate that physiotherapy interventions decrease spasticity but this may reflect a lack of research on the topic. Future trials should focus on participant-reported measures of spasticity that distinguish between the immediate, short-term and long-term effects of any physiotherapy intervention.

## A tele-health intervention to increase physical fitness in people with spinal cord injury and cardiometabolic disease or risk factors: a pilot randomized controlled trial.

Charles H Bombardier, Joshua R Dyer, Patricia Burns, Deborah A Crane, Melissa M Takahashi, Jason Barber, Mark S Nash  
Spinal Cord. 2021 Jan;59(1):63-73.

### Abstract

#### Study design

Clinical trial.

#### Objectives

We used a single-blind parallel-group design to test the feasibility and preliminary efficacy of a telehealth-based physical activity counseling intervention to increase physical fitness in people with SCI.

#### Setting

Seattle, Washington, United States.

#### Methods

We recruited under-active, manual wheelchair-using adults at least 1-year post-SCI who had at least two cardiometabolic risk factors/diseases. Participants underwent baseline tests of peak cardiorespiratory fitness; lipids, glucose and insulin; muscle and fat mass; self-reported physical activity, depression, pain and other factors. Participants were assigned 1:1 to treatment vs. usual care (UC) control conditions via concealed computerized randomization. Treatment

was delivered via telephone and adapted from the 16-session Diabetes Prevention Program. All baseline tests were repeated at 6 months. Prespecified feasibility goals were to recruit at least nine participants/quarter and retain 85% with complete fitness testing at 6 months. Prespecified efficacy goals were to demonstrate at least a medium treatment effect size (0.50) on fitness, self-reported physical activity, and other outcomes.

#### Results

Seven participants were randomized to treatment, 8 to UC over 15 months. Maximum recruitment was only 5.4 participants/quarter. Thirteen (87%) of participants were retained. The effects of treatment on fitness and most cardiometabolic risk factors did not meet expectations, whereas the effects on self-reported physical activity, depression, and pain did meet expectations.

#### Conclusions

The study did not meet key efficacy and feasibility objectives, yet there were some promising effects on self-report measures and lessons to be learned for designing future trials.

## Spinal cord involvement in COVID-19: A review.

Ravindra Kumar Garg, Vimal Kumar Paliwal, Ankit Gupta  
J Spinal Cord Med. 2021 Mar 11;1-15.

### Abstract

#### Context

Recent literature points towards myelitis, like encephalitis, as a common central nervous system complication of COVID-19. This review elaborates on disorders of the spinal cord caused by the SARS-CoV-2 virus.

#### Objectives

To review the published data about SARS-CoV-2-associated spinal cord disorders and assess their clinical, neuroimaging, treatment, and prognostic aspects.

#### Methods

The PubMed and Google Scholar databases were searched for published cases using the search items "COVID-19 OR SARS-CoV-2 AND myelitis", "COVID-19 OR SARS-CoV-2 AND myelopathy", and "COVID-19 OR SARS-CoV-2 AND spinal cord".

#### Results

Thirty-three isolated cases were included in the present review, of which 14 were aged 60 years and above (range: 3-70 years). Eighteen patients had lung

abnormalities on chest imaging. Eight patients had developed either an areflexic paraparesis or quadriparesis. In 17 patients, neuroimaging demonstrated longitudinally extensive transverse myelitis, while 3 cases showed neuroimaging changes in the spinal cord as a part of acute disseminated encephalomyelitis syndrome. Cerebrospinal fluid (CSF) examinations revealed inflammatory changes in 18 patients. However, the SARS-CoV-2 virus in the CSF was discovered in 2 patients. In 2 patients, anti-SARS-CoV-2 antibodies were demonstrated in the CSF. Following treatment, 13 patients were able to walk.

#### Conclusions

A variety of COVID-19-related spinal cord manifestations, such as acute transverse myelitis, acute necrotizing myelitis, SARS-CoV-2 myelitis, acute disseminated encephalomyelitis, neuromyelitis optica spectrum disorder, hypoxic myelopathy, MOG antibody-associated myelitis, spinal cord infarction, and spinal epidural abscess, have been reported. The possible mechanisms of this involvement being direct invasion, cytokine storm, coagulopathy, and an autoimmune response. However, response to treatment has been generally unsatisfactory, with many patients having residual weakness necessitating long-term rehabilitation.

# Use and Outcome of Local Anesthetic Painkilling Injections in Athletes: A Systematic Review.

Gultekin, Sinem; Chaker Jomaa, Mohammad; Jenkin, Rebekah; More  
Clinical Journal of Sport Medicine. 31(1):78-85, January 2021.

## Background

The use of local anesthetic painkilling injections to improve player availability is common practice in elite-level sport.

## Objective

To document the published use of local anesthetic injections in sport, according to number of injections, sites of injections, and complications reported.

## Data Sources

A systematic search of MEDLINE, Embase, CINAHL, AMED, Cochrane Database of Systematic reviews, SportDiscus, EBSCO Host, and Google Scholar.

## Results

One thousand nine hundred seventy local anesthetic injections reported on 540 athletes in 10 studies (from rugby league, American football, Australian football, and soccer) were reviewed. The most common areas of injection were as follows: the acromioclavicular (AC) joint; hand (including fingers); sternoclavicular joint

(including sternum); rib injuries; and iliac crest contusions.

## Discussion

This review found some evidence of long-term safety for a limited number of injection sites (eg, AC joint) and some evidence of immediate complications and harmful long-term consequences for other sites. The quality of evidence is not high, with little long-term data and a lack of independent verification of the effects of the injections. Ideally, long-term follow-up should be conducted to determine whether these injections are safe, with follow-up undertaken independently of the treating physician and team.

## Conclusions

Based on limited publications, there is some evidence of long-term safety; however, there is a lack of clear proof of either absolute safety or long-term harm for many of these procedures. Physicians and players in professional sport should proceed with caution in using local anesthetic injections.

## Are web-based personally tailored physical activity videos more effective than personally tailored text-based interventions? Results from the three-arm randomised controlled TaylorActive trial.

Corneel Vandelanotte, Camille E Short, Ronald C Plotnikoff, Amanda Rebar I, Stephanie Alley, Stephanie Schoeppe, Doreen F Canoy, Cindy Hooker, Deborah Power, Christopher Oldmeadow, Lucy Leigh, Quyen To, W Kerry Mummery, Mitch J Duncan  
British Journal of Sports Medicine 2021;55:336-343.

### Objectives

Some online, personally tailored, text-based physical activity interventions have proven effective. However, people tend to 'skim' and 'scan' web-based text rather than thoroughly read their contents. In contrast, online videos are more engaging and popular. We examined whether web-based personally tailored physical activity videos were more effective in promoting physical activity than personally tailored text and generic information.

### Methods

501 adults were randomised into a video-tailored intervention, text-tailored intervention or control. Over a 3-month period, intervention groups received access to eight sessions of web-based personally tailored physical activity advice. Only the delivery method differed between intervention groups: tailored video versus tailored text. The primary outcome was 7-day ActiGraph-GT3X+ measured moderate-to-vigorous physical activity (MVPA) assessed at 0, 3 and 9 months. Secondary outcomes included self-reported MVPA and website engagement. Differences were examined using generalised linear mixed models with intention-to-treat and multiple imputation.

### Results

Accelerometer-assessed MVPA increased 23% in the control (1.23 (1.06, 1.43)), 12% in the text-tailored (1.12 (0.95, 1.32)) and 28% in the video-tailored (1.28 (1.06, 1.53)) groups at the 3-month follow-up only, though there were no significant between-group differences. Both text-tailored (1.77 (1.37, 2.28)) and video-tailored (1.37 (1.04, 1.79)) groups significantly increased self-reported MVPA more than the control group at 3 months only, but there were no differences between video-tailored and text-tailored groups. The video-tailored group spent significantly more time on the website compared with text-tailored participants (90 vs 77 min,  $p=0.02$ ).

### Conclusions

The personally tailored videos were not more effective than personally tailored text in increasing MVPA. The findings from this study conflict with pilot study outcomes and previous literature. Process evaluation and mediation analyses will provide further insights.

## Biomechanical Effects of Blood Flow Restriction Training after ACL Reconstruction.

Telfer, Scott & Calhoun, John & Bigham, Joseph & Mand, Simran & Gellert, Joshua & Hagen, Mia & Kweon, Christopher & Gee, Albert. Med Sci Sports Exerc 2021 Jan;53(1):115-123

### Introduction

After anterior cruciate ligament reconstruction surgery, returning the knee to previous levels of strength and function is challenging, with the failure to do so associated with an increased risk of re-injury and long-term degenerative problems. Blood flow restriction (BFR) is gaining popularity as a rehabilitation technique, however its effects on the mechanics of these exercises have not been fully explored. In this study we aimed to determine the acute effects of BFR on the performance of a step-up exercise protocol, and to assess the acceptability of the technique.

### Methods

Twenty individuals (12 female / 8 male, mean age 30.6 years), who had recently undergone anterior cruciate ligament reconstruction and 20 controls (11 female / 9 male, mean age 28.0 years) performed a step-up exercise protocol with and without BFR. Lower limb kinematics and kinetics were measured and compared between groups and conditions. Testing was completed in June 2019.

### Results

Participants in both groups had increased external rotation of the tibia of  $2^\circ$  ( $p < 0.001$ ) and reductions in knee flexion and rotation torques around the joint of around 50% ( $p < 0.001$ ) when using BFR compared to non-restricted step-up exercise. The intervention was found to increase the difficulty of the exercise and induce moderate levels of discomfort ( $p < 0.001$ ).

### Conclusion

The present study provides cautious support for the use of BFR, showing that there are minimal changes in knee joint mechanics when performing the same exercise without BFR, and that the changes do not increase joint torques at the knee. From an acute biomechanical perspective, the intervention appears safe to use under qualified supervision, however effects of repetitive use and long-term outcomes should be monitored.

# Access to assistive technology for persons with disabilities: a critical review from Nepal, India and Bangladesh.

Jiban Karki, Simon Rushton, Sunita Bhattarai & Luc De Witte (2021) Access to assistive technology for persons with disabilities: a critical review from Nepal, India and Bangladesh, *Disability and Rehabilitation: Assistive Technology*, DOI: 10.1080/17483107.2021.1892843.  
*Disability and Rehabilitation: Assistive Technology*.

## Abstract

### Purpose

The purpose of this paper is to analyse and critically reflect on access to Assistive Technology (AT) for persons with disabilities (PWD) in Nepal, India and Bangladesh. This analysis aims to guide the development of a contextualised generic AT service delivery model suitable for these countries, based on the best practices identified.

### Materials and methods

This paper is based on a comprehensive study conducted in Nepal, India and Bangladesh, observing mobility and hearing-related AT service delivery centres run by the government, as well as private and nongovernmental organisations, and interviews with key informants: policymakers (5), AT service providers (20) and AT service users (20) between December 2019 to February 2020. A descriptive, qualitative exploratory study design was followed. A quality assessment framework was used to structure the analysis and interpret the findings.

### Results

AT service provisions are poorly developed in all three countries. On all quality indicators assessed, the

systems show major weaknesses. AT users have very limited awareness about their rights to these services and the availability of AT services, the range of services available is very limited, and eligibility is dependent on medical criteria related to visible and severe disabilities.

### Conclusions

Lack of accessibility, eligibility, reachability and affordability are the main barriers to access AT services for PWD in Nepal, India and Bangladesh. Increased community level awareness, increased Government funding and a community based, medically informed flexible social model of AT services is a way forward to ensure access to AT services for PWD in these countries.

### Implications for rehabilitation

- Increased community awareness is necessary to increase access to Assistive Technology Services for Persons with Disabilities.
- Increased and flexible funding from the Government and philanthropists will improve rehabilitation.
- Establishment of community based Assistive Technology Services centres will increase access and improve rehabilitation.

## Management strategies for neurogenic lower urinary tract dysfunction: a qualitative study of the experiences of people with multiple sclerosis and healthcare professionals.

Hawra B. Al Dandan, Rose Galvin, Doreen McClurg, Susan Coote & Katie Robinson (2021) Management strategies for neurogenic lower urinary tract dysfunction: a qualitative study of the experiences of people with multiple sclerosis and healthcare professionals, Disability and Rehabilitation, DOI: 10.1080/09638288.2021.1887378.

### Purpose

Urinary symptoms are highly prevalent among people with MS. This study aimed to explore the experiences of people with MS and HCPs in managing urinary symptoms and explore their views on using TTNS to treat urinary symptoms.

### Materials and methods

Audio-recorded semi-structured, interviews were employed with people with MS and HCPs. All transcribed interviews were exported to NVivo software (Version 12) and analyzed using a reflexive approach to thematic analysis.

### Results

Four main themes were identified; The wide-ranging negative impacts of urinary symptoms (“It’s limited everything else”), Gaps in urinary services (“Is there somebody like that, sort of specialized in that area?”), Management strategies (“I don’t go too far from the toilet in case I need to use one”), and optimism about TTNS (“Are you giving Me Hope?”).

### Conclusion

Urinary symptoms are common and very troublesome for people with MS. Despite their prevalence, many people with MS continue to suffer in silence. People with MS require skilled multidisciplinary services guided by clinical care pathways to improve service provision and to address urinary symptoms. HCP’s and people with MS are open to the use of TTNS for urinary symptoms and have clear preferences for location and duration of intervention delivery.

### Implications for rehabilitation

- Urinary symptoms are very common and troublesome for people with multiple sclerosis, yet many continue to suffer in silence.
- People with multiple sclerosis lack knowledge about treatment options for urinary symptoms.
- There is an on-going need for healthcare provider education on guidelines for screening and managing urinary symptoms in people with MS and the role of specialist urinary service providers.
- HCP’s and people with MS are open to the use of TTNS for urinary symptoms.

## Performance during dual-task walking in a corridor after mild traumatic brain injury: A potential functional marker to assist return-to-function decisions.

Gagné MÈ, McFadyen BJ, Ouellet MC.  
Brain injury. 2021 Jan 11:173-179.

### Objective

To compare the performance of participants with mTBI and healthy control on locomotor-cognitive dual-tasks in a corridor with limited technology.

### Design

Prospective study of twenty participants with mTBI (10 women;  $22.10 \pm 2.97$  years;  $70.9 \pm 22.31$  days post-injury), and 20 sex- and age-matched control participants (10 women;  $22.55 \pm 2.72$  years).

### Methods

Participants performed six different dual-tasks combining locomotor tasks (level-walking, obstacle-crossing, and tandem gait) and cognitive tasks (counting backwards and verbal fluency). Symptoms and neuropsychological performance were also assessed.

### Results

No differences between groups were found for symptoms and neuropsychological measures. For gait speed, the group effect was not significant, but a significant group X cognitive task interaction was found, revealing a tendency toward slower gait speed in the mTBI group during dual-task conditions. A significantly greater dual-task cost for gait speed was found for the mTBI group. Although no statistically significant differences in cognitive performance were observed during dual-tasks, the mTBI group subjectively reported being significantly less concentrated.

### Conclusion

The present study revealed that in persons who seem to have well recovered after mTBI, on average 71 days post-injury, alterations in gait are detectable using a simple, “low-tech,” corridor-based dual-task walking assessment.

## Investigating Therapies for Freezing of Gait Targeting the Cognitive, Limbic, and Sensorimotor Domains.

Chow R, Tripp BP, Rzondzinski D, Almeida QJ.  
Neurorehabilitation and Neural Repair. 2021 Mar; 35:290-299.

### Background

Freezing of gait (FOG) is arguably the most disabling motor symptom experienced with Parkinson's disease (PD), but treatments are extremely limited due to our poor understanding of the underlying mechanisms. Three cortical domains are postulated in recent research (ie, the cognitive, limbic, and sensorimotor domains), thus, treatments targeting these mechanisms of FOG may potentially be effective. Cognitive training, cognitive behavioral therapy (CBT, a well-known anxiety intervention), and proprioceptive training may address the cognitive, limbic, and sensorimotor domains, respectively.

### Objective

To investigate whether these 3 treatments could improve functional outcomes of FOG.

### Methods

In a single-blind, randomized crossover design, 15 individuals with PD and FOG were randomized into different, counterbalanced orders of receiving the interventions. Each consisted of eight 1-hour sessions, twice weekly for 4 weeks. FOG severity was assessed as the primary outcome using a novel gait paradigm that was aimed at evoking FOG when the cognitive, limbic,

or sensorimotor domains were independently challenged.

### Results

FOG severity significantly improved after the cognitive intervention, with strong trends toward improvement specifically in the baseline and cognitive-challenge assessment conditions. CBT, as the anxiety intervention, resulted in significantly worse FOG severity. In contrast, proprioceptive training significantly improved FOG severity, with consistent trends across all conditions.

### Conclusions

The cognitive and proprioceptive treatments appeared to improve different aspects of FOG. Thus, either of these interventions could potentially be a viable treatment for FOG. However, although the results were statistically significant, they could be sensitive to the relatively small number of participants in the study. Considering the significant results together with nonsignificant trends in both FOG and gait measures, and given equal time for each intervention, proprioceptive training produced the most consistent indications of benefits in this study. (clinicaltrials.gov NCT03065127).

## Physical activity after ischemic stroke and its association with adverse outcomes: A nationwide population-based cohort study.

Kang SM, Kim SH, Han KD, Paik NJ, Kim WS.  
Topics in Stroke Rehabilitation. 2021 Mar 31:170-180.

### Background

Sufficient physical activity (PA) is highly recommended to improve the prognosis after stroke. However, there have been only a few studies evaluating the changes in PA level after stroke.

### Aims

We aimed to identify the changes in PA level between before and after stroke, and to determine the association between PA and adverse outcomes.

### Methods

This observational, retrospective cohort study was performed using the Nationwide Health Insurance Service (NHIS) database in South Korea. Subjects between the ages of 20 to 80 years, who had a first-ever ischemic stroke from 2010 to 2013, were included. Subjects were divided into either the “sufficient” or “insufficient” subgroups, depending on the result of the self-reported PA questionnaire. Adverse outcomes, including all-cause mortality, stroke recurrence, and myocardial infarction (MI), were collected from a post-stroke health checkup to 2017.

### Results

Of the 34,243 subjects with ischemic stroke, only 21.24% had sufficient PA level after stroke. Among those with insufficient PA level, only 17.34% improved their PA level after stroke. Subjects with sufficient PA level after stroke, regardless of their PA level prior to stroke, showed a lower risk of composite adverse outcomes (adjusted Hazard Ratio [HR], 95% CI: 0.85, 0.80–0.90). Subjects who went from insufficient to sufficient PA level (HR 0.87, 95% CI: 0.81–0.93) showed a significantly lower risk of composite adverse outcomes.

### Conclusions

Achieving a sufficient PA level after ischemic stroke appears to significantly reduce major adverse events. Further effort is needed to promote the PA level after ischemic stroke.

## Mood, psychological, and behavioral factors of health-related quality of life throughout recovery from sport concussion.

Walton SR, Broshek DK, Kranz S, Malin SK, Hertel J, Resch JE.  
The Journal of Head Trauma Rehabilitation. 2021 Mar;36:128-136.

### Objective

To measure alterations in mood, psychological, and behavioral factors in collegiate athletes throughout recovery from sport concussion (SC) compared with matched controls.

### Setting

University research laboratory.

### Participants

Twenty (55% female) division I collegiate athletes with SC ( $19.3 \pm 1.08$  years old,  $1.77 \pm 0.11$  m,  $79.6 \pm 23.37$  kg) and 20 (55% female) uninjured matched controls ( $20.8 \pm 2.17$  years old,  $1.77 \pm 0.10$  m,  $81.9 \pm 23.45$  kg).

### Design

Longitudinal case control.

### Main Measures

Self-reported concussion-related symptoms, anxiety, resilience, stigma, sleep disturbance, fatigue, and appetite were assessed at 3 time points in the SC group:

T1 ( $\approx 72$  hours of SC), T2 (7 days after T1), and TF (after symptom resolution). Control participants were evaluated at similar intervals. Group and group-by-sex differences were assessed using repeated-measures analyses of variance. Post hoc analyses were performed with Tukey's honestly significant difference (HSD) and paired-sample t tests.

### Results

The SC group had greater sleep disturbance than controls at T1 ( $P = .001$ ;  $d = 1.21$ ) and endorsed greater stigma at all time points ( $P \leq .03$ ;  $d \approx 0.80$ ). Stigma ( $F(2) = 3.68$ ;  $P = 0.03$ ;  $\eta^2_p = 0.12$ ), sleep disturbance ( $F(2) = 5.27$ ;  $P = .008$ ;  $\eta^2_p = 0.15$ ), and fatigue ( $F(2) = 3.46$ ;  $P = .04$ ;  $\eta^2_p = 0.11$ ) improved throughout recovery in those with SC only. No differences were observed between males and females ( $P > .05$ ).

### Conclusion

Sleep disturbance and stigma were negatively affected by SC, highlighting potential areas for clinical interventions to maximize recovery in males and females.

## Physical therapeutic treatment for traumatic brachial plexus injury in adults: A scoping review.

Alessandra Carolina de Santana Chagas<sup>1</sup>, Débora Wanderley<sup>1</sup>, Josepha Karinne de Oliveira Ferro<sup>1</sup>, Alexa Alves de Moraes<sup>1</sup>, Fernando Henrique Morais de Souza<sup>2</sup>, Angélica da Silva Tenório<sup>1</sup>, Daniella Araújo de Oliveira<sup>1</sup>  
PM & R 2021 Feb 5.

### Abstract

Traumatic brachial plexus injury (BPI) is one of the most disabling injuries of the upper extremity, often requiring specialized treatment and a prolonged rehabilitation period. This scoping review was carried out to identify and describe the physical therapy modalities applied in the rehabilitation of adult individuals with BPI. Electronic databases, gray literature, and reference lists were searched, and studies meeting the following eligibility criteria were included: (a) interventions including any physical therapy modality; (b) individuals age  $\geq$  18 years old; and (c) a clinical diagnosis of BPI. The literature search yielded 681 articles of which 49 met the inclusion criteria and had their outcomes, treatment parameters,

and the differences between conservative and pre- and postoperative treatment phases analyzed. The most commonly used physical therapy interventions were in the subfields of kinesiotherapy (ie, involving range of motion exercises, muscle stretching, and strengthening), electrothermal and phototherapy, manual therapy, and sensory re-education strategies. Although several physical therapy modalities were identified for the treatment of BPI in this scoping review, the combination of low levels of evidence and the identified gaps regarding the treatment parameters challenge the reproducibility of such treatments in clinical practice. Therefore, future controlled clinical trials with clearer treatment protocols for individuals with BPI are needed.

## Predictors for long-term curve progression after Boston brace treatment of idiopathic scoliosis.

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European Journal of Physical and Rehabilitation Medicine 2021 February;57(1):101-9.

### Background

Identifying factors that predict successful bracing in patients with idiopathic scoliosis may help planning treatment.

### Aim

To assess predictors for long-term curve progression and health-related quality of life after Boston brace treatment.

### Design

Observational retrospective cohort study with analysis of brace treated patients followed from start until at least 10 years after treatment.

### Setting

Patients recruited from the country's entire population consecutively treated at the National Hospital.

### Population

365 patients (339 girls/26 boys) with idiopathic scoliosis. Mean (SD) chronological age/bone age at start bracing was 13.2 (1.9)/12.6 (1.9) years. The primary major curve measured 33.2 (7.4°), and the major levels were thoracic (N.=248), thoracolumbar (N.=78) and lumbar (N.=39). Mean bracing time was 2.8 (1.5) years. Long-term follow-up was in average 23.3 (4.1) years after weaning with a mean major curve of 33.0 (13.1°). Successful treatment was defined as a stable primary curve with progression  $\leq 5^\circ$ , and secondary the SRS-22 questionnaire assessed quality of life.

### Methods

We applied linear or logistic regression with backward elimination. Internal validation was assessed by bootstrapping. Twelve variables were included in the prediction models: age, bone age, scoliosis in close family, major curve size, level, shape, flexibility and in-brace redressement, compliance, curve magnitude after 1 year, treatment time and quality of life (SRS-22).

### Results

290 patients (79%) had rated good compliance using the brace >20 hours daily. Treatment failure was observed in 65 patients (18%), and 27 of them were operated. The best baseline predictors were age and brace redressement. During treatment compliance, major curve after 1 year, and treatment time were the best predictors, while thoracic major curve, curve size at start bracing and scoliosis in close family also contributed to the final model. The model's ability to predict quality of life was low.

### Conclusions

The best predictors for a long-term success were good redressement and compliance, unchanged or reduced major curve after one year and short treatment time.

### Clinical rehabilitation impact

Predictors at baseline and during early treatment can help identifying patients who benefit from bracing.

## Long-Term Effectiveness and Tolerability of Pain Treatment with Tapentadol Prolonged Release.

Rafael Galvez Mateos, Daniel Samper Bernal, Luis Miguel Torres Morera, Cesar Margarit Ferri, Ana Esquivias Escobar  
Pain Physician. 2021 Jan;24(1):E75-E85.

### Abstract

#### Background

The central analgesic tapentadol prolonged release (PR) has proven effective and generally well tolerated in a broad range of chronic pain conditions. Long-term data of its use are still scarce.

#### Objectives

To evaluate long-term effectiveness, tolerability, and safety of tapentadol PR in patients with severe chronic osteoarthritis (OA) knee pain or low back pain (LBP) who responded to tapentadol in 1 of 4 preceding 12-week phase 3b clinical trials.

#### Study design

Open-label, uncontrolled, observational extension study of up to 72 weeks.

#### Setting

Fourteen centers in Spain. Protocol approval by the reference ethics committee for all the participating centers.

#### Methods

Eligible patients started the extension trial on the tapentadol PR dosage optimized for them in the preceding trial; dose adjustments were permitted throughout the extension. Treatment effectiveness outcomes included changes in pain intensity, sleep, state of health, quality of life, patient and clinician global impression of change, and patients' satisfaction with treatment. Patients with OA knee pain also answered the Western Ontario and McMaster Universities OA index, and patients with LBP with a possible neuropathic pain component completed neuropathic pain-related questionnaires.

### Results

Eighty-three patients were enrolled: 40 with OA knee pain, 43 with LBP. The full analysis set consisted of 81 patients. Mean pain intensity remained relatively stable over the 72-week extension period with mean increases from baseline of 0.44 (95% confidence interval [CI], -0.1, 1.0; Numeric Rating Scale) for all patients, 0.2 (95% CI, -0.5, 0.9) for patients with OA, and 0.68 (95% CI, -0.2, 1.6) for patients with LBP. State of health and quality of life baseline ratings were maintained; overall impression of change was "improved." Most patients (88.9%) reported at least good treatment satisfaction at the end of treatment. Mean daily tapentadol PR doses slightly increased from  $313.3 \pm 139.5$  mg at baseline to  $315.7 \pm 140.1$  mg at end of study. Uptitration was required for 8.4% of the patients, 4.8% had a dose reduction during the trial. Adverse events considered probably/likely or certainly related to tapentadol PR treatment by the investigator were documented for 18.1% of all patients, most commonly constipation (7.2%). Seven patients (8.4%) experienced adverse events leading to premature discontinuation.

### Limitations

An open-label design, stable concomitant analgesics (World Health Organization step I), and dose adjustments were allowed during the study. All patients had benefitted from tapentadol PR in preceding trials.

### Conclusions

Sustained pain relief and quality of life for up to 72 treatment weeks under relatively stable dosing, as well as the good safety profile, indicate the usefulness of tapentadol PR for patients who suffer from severe chronic OA knee pain and LBP with limited risk for tolerance development.

# Use of the International Classification of Functioning, Disability and Health to support goal-setting practices in pediatric rehabilitation: a rapid review of the literature,

Linda Nguyen, Andrea Cross, Peter Rosenbaum & Jan Willem Gorter. Use of the International Classification of Functioning, Disability and Health to support goal-setting practices in pediatric rehabilitation: a rapid review of the literature. *Disability and Rehabilitation*. 2021;43(6):884-894. *Disability and Rehabilitation*.

## Abstract

### Introduction

The International Classification of Functioning, Disability and Health (referred to as the ICF) is the World Health Organization's framework for health. It can be used to identify goals that capture all aspects of a person's life and to inform clinical goal-setting processes. This review aims to report how healthcare providers are using the ICF framework to support goal-setting practices in pediatric rehabilitation services.

### Methods

A rapid review was conducted using scoping review principles in the following databases: CINAHL, Medline and PsycINFO. Key terms included: "ICF", "goal-setting" and "pediatrics".

### Results

Sixteen studies met the inclusion criteria. Three main themes emerged about the use of the ICF in pediatric rehabilitation: 1) match the content of goals to the ICF domains; 2) implement with existing tools for goal-setting; and 3) inform the development of new tools for goal-setting. Healthcare providers often use a combination of goal-setting tools. The SMART approach is used to frame goals, while the Canadian Occupational Performance Measure and Goal Attainment Scale have been used to document and evaluate goals.

## Conclusion

The ICF framework can be used with current goal-setting practices and offers a common lens and language with which to facilitate collaborative goal-setting with families and healthcare providers.

### Implications for Rehabilitation

- The International Classification of Functioning, Disability and Health (ICF) provides a common framework and language to support collaborative goal-setting between families and healthcare providers
- Despite the opportunity for the ICF to be used as a framework with goal-setting approaches, to date the ICF has mainly been used to match the content of goals to ICF domains for documentation purposes
- The ICF should be incorporated into the established clinical routines in order to promote its use among healthcare providers
- The ICF can be used with existing goal-setting tools in clinical practice and to inform the ongoing development of new tools to support the goal-setting process in family-centred services

## AbsDisability and Rehabilitation: Assistive Technology 3D printing and amputation: a scoping review.

Danielle Ribeiro, Stephanie R. Cimino, Amanda L. Mayo, Matt Ratto & Sander L. Hitzig. 3D printing and amputation: a scoping review. *Disability and Rehabilitation: Assistive Technology*. 2021;16(2):221-240.

### Purpose

Three-dimensional (3D) printing is an innovative technology being utilized to create prostheses for individuals with limb loss. However, there is a paucity of research on the feasibility of using this technology to fabricate prostheses. A scoping review was conducted to map the literature on 3D printing and its applications in the field of amputation.

### Materials and methods

Using a scoping review framework, a systematic literature search was conducted in three electronic databases (MEDLINE, EMBASE and CINAHL) for all indexed literature up to 29 June 2018.

### Results

Twenty-eight articles met the inclusion criteria. The majority of studies had small sample sizes (five participants or less;  $n = 20$ ) and used a case study design ( $n = 17$ ). The benefits of 3D printing technology include higher levels of customization and lower production costs. However, the functionality of 3D printed prostheses is lacking. There is also a need for more robust research designs to obtain a better understanding of the advantages and disadvantages of 3D printed prostheses and its impact on end-user outcomes.

### Conclusions

The use of 3D printing technology has a number of benefits for improving the manufacturing process of devices for people with lower and upper limb loss. However, more research and technological advancements are required to fully understand the impact of this technology on patients and how it will affect their daily life. The long-term effects of this technology will also need to be investigated in order to produce a more sustainable alternative to traditional prostheses.

### Implications for rehabilitation

- The use of 3D printing technology for the fabrication of prosthetics for persons with limb-loss has a number of promising features to improve the fitting and customization of these devices for this patient population.
- Although the costs of producing 3D printed devices is less expensive and burdensome than traditional approaches to manufacturing techniques, there is a need for additional technological advancements to improve the functionality of these devices.
- Future research needs to adopt more robust research designs with larger sample sizes to provide a better understanding of the viability of using 3D printing technology to improve patient outcomes.

## In Spasticity,

Rx Antispastic

# Baclof

Baclofen 10/25 mg Tab

Scored tablet



Flexibility for dosage titration

## Backing Possibilities

## In Cerebral Palsy,

Rx Flexi-dosing antispastic

# Baclof

Baclofen 5 mg / 5 ml *Liquid*

## Backing Possibilities

Supports patients initiatives programs



### Abridged Prescribing Information (BACLOF)

**Active Ingredient:** each tablet of BACLOF contains: baclofen 10, 25 mg. BACLOF liquid contains baclofen 5mg/5ml, 100 ml bottle. **Indication:** treatment of spasticity resulting from multiple sclerosis, particularly for the relief of flexor spasms and concomitant pain, clonus, and muscular rigidity. **Dosage:** Tablets: Initiate with a low dosage, preferably in divided doses, administered orally. Increase gradually based on clinical response and tolerability. The maximum dosage is 80 mg daily (20 mg four times a day). When discontinuing, reduce the dosage slowly. Liquid: adults: One 5ml spoonful (5mg) 3 times a day for 3 days; Two 5ml spoonfuls (10mg) 3 times a day for 3 days; Three 5ml spoonfuls (15mg) 3 times a day for 3 days; Four 5ml spoonfuls (20mg) 3 times a day for 3 days. Elderly: Small doses should be used at the start of treatment, the dose being titrated gradually against the response, under careful supervision. Paediatric population (0 to < 18 years): A dosage of 0.75-2mg/kg body weight should be used. In children over ten years of age, however a maximum daily dosage of 2.5mg/kg body weight may be given. Treatment is usually started with half a 5ml spoonful (2.5mg). The recommended daily dosages for maintenance therapy are as: 12 months – 2 years: Two to four 5ml spoonfuls (10-20mg), 2 years – 6 years: Four to six 5ml spoonfuls (20-30mg); 6 years – 10 years: Six to twelve 5ml spoonfuls (30-60mg). **Contraindications:** hypersensitivity to baclofen or any component of this product. **Warning and precautions:** Abrupt discontinuation of baclofen has resulted in serious adverse reactions including death; therefore, reduce the dosage slowly when baclofen is discontinued. Neonatal withdrawal symptoms can occur; gradually reduce the dosage and discontinue baclofen before delivery. Baclofen can cause drowsiness and sedation. Patients should avoid the operation of automobiles or other dangerous machinery until they know how the drug affects them. Advise patients that the central nervous system effects of baclofen may be additive to those of alcohol and other CNS depressants. Baclofen can cause exacerbation of the following: psychotic disorders, schizophrenia, or confusional states; autonomic dysreflexia; epilepsy. Use with caution in patients with these conditions. **Pregnancy & Lactation:** Pregnancy: Based on animal data, may cause fetal harm. At recommended oral doses, baclofen is present in human milk. There are no human data on the effects of baclofen on milk production and on breastfed infant. **Interaction:** CNS depressants like benzodiazepines, antihistamine, antipsychotic, and alcohol etc., may cause increased sedative effects. Morphine (epidural) may cause hypotension and dyspnea. Laboratory Test Interactions may cause false elevation of AST (aspartate aminotransferase), alkaline phosphatase, or blood glucose. **Adverse reactions:** most common drowsiness, dizziness, and weakness. **Overdose:** Symptoms: Patients may present in coma or with progressive drowsiness, lightheadedness, dizziness, somnolence, accommodation disorders, respiratory depression, seizures, or hypotonia progressing to loss of consciousness. Treatment: includes gastric decontamination, maintaining an adequate airway and respirations. (Prepared on 23rd Feb 2020. It is recommended to refer full prescribing information before prescription. For further medical information, please write to: Intas Pharmaceuticals Ltd., Corporate House, Near Sola Bridge, SG highway, Thaltej, Ahmedabad-380054, Gujarat, India. productqueries@intaspharma.com.)

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