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New and Updated Cochrane Systematic Reviews

New Reviews – January 2015

Protocol-directed sedation versus non-protocol-directed sedation to reduce duration of mechanical ventilation in mechanically ventilated intensive care patients

Updated Reviews – January 2015

Repositioning for treating pressure ulcers

Journal Articles

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1. Title: A neuroprosthesis for control of seated balance after spinal cord injury.
   Citation: Journal of Neuroengineering & Rehabilitation, 2015, vol./is. 12/1(8), 1743-0003;1743-0003 (2015)
   Author(s): Audu ML, Lombardo LM, Schnellenberger JR, Foglyano KM, Miller ME, Triolo RJ
   Language: English
   Abstract: BACKGROUND: A major desire of individuals with spinal cord injury (SCI) is the ability to maintain a stable trunk while in a seated position. Such stability is invaluable during many activities of daily living (ADL) such as regular work in the home and office environments, wheelchair propulsion and driving a vehicle. Functional neuromuscular stimulation (FNS) has the ability to restore function to paralyzed muscles by application of measured low-level currents to the nerves serving those muscles. METHODS: A feedback control system for maintaining seated balance under external perturbations was designed and tested in individuals with thoracic and cervical level spinal cord injuries. The control system relied on a signal related to the tilt of the trunk from the vertical position (which varied between 1.0erect posture and 0.0most forward flexed posture) derived from a sensor fixed to the sternum to activate the user’s own hip and trunk extensor muscles via an implanted neuroprosthesis. A proportional-derivative controller modulated stimulation between trunk tilt values indicating deviation from the erect posture and maximum desired forward flexion. Tests were carried out with external perturbation forces set at 35%, 40% and 45% body-weight (BW) and maximal forward trunk tilt flexion thresholds set at 0.85, 0.75 and 0.70. RESULTS: Preliminary tests in a case series of five subjects show that the controller could maintain trunk stability in the sagittal plane for perturbations up to 45% of body weight and for flexion thresholds as low as 0.7. The mean settling time varied across subjects from 0.5(+/-0.4) and 2.0 (+/-1.1) seconds. Mean response time of the feedback control system varied from 393(+/-38) ms and 536(+/-84) ms across the cohort. CONCLUSIONS: The results show the high potential for robust control of seated balance against nominal perturbations in individuals with spinal cord injury and indicates that trunk control with FNS is a promising intervention for individuals with SCI.
   Publication type: Journal Article
   Source: MEDLINE
   Full text: Available ProQuest at Journal of NeuroEngineering and Rehabilitation

2. Title: A preliminary comparison of myoelectric and cyclic control of an implanted neuroprosthesis to modulate gait speed in incomplete SCI
   Citation: Journal of Spinal Cord Medicine, January 2015, vol./is. 38/1(115-122), 1079-0268;2045-7723 (01 Jan 2015)
   Author(s): Lombardo L.M., Bailey S.N., Foglyano K.M., Miller M.E., Pinault G., Triolo R.J.
   Language: English
   Abstract: Objective: Explore whether electromyography (EMG) control of electrical stimulation for walking after incomplete spinal cord injury (SCI) can affect ability to modulate speed and alter gait spatial-temporal parameters compared to cyclic repetition of pre-programmed stimulation. Design: Single case study with subject acting as own concurrent control. Setting: Hospital-based biomechanics laboratory. Participants: Single subject with C6 AIS D SCI using an implanted neuroprosthesis for walking. Interventions: Lower extremity muscle activation via an implanted system with two different control methods: (1) pre-programmed pattern of stimulation, and (2) EMG-controlled stimulation based on signals from the gastrocnemius and quadriceps. Outcome measures: Gait speed, distance, and subjective rating of difficulty during 2-minute walks. Range of walking speeds and associated cadences, stride lengths, stride times, and double support times during quantitative gait analysis. Results: EMG control resulted in statistically significant increases in both walking speed and distance (P < 0.001) over cyclic stimulation during 2-minute walks. Maximum walking speed with EMG control (0.48 m/second) was significantly (P < 0.001) faster than the fastest automatic pattern (0.39 m/second), with increased cadence and decreased stride and double support times (P < 0.000) but no change in stride length (z = -0.932). The slowest walking with EMG control (0.25 m/second) was virtually indistinguishable from the slowest with automatic cycling (z = -0.39; P = 0.811). Conclusion: EMG control can increase the ability to modulate comfortable walking speed over pre-programmed cyclic stimulation. While control methods did not differ at the lowest speed, EMG-triggered stimulation allowed significantly faster walking than cyclic stimulation. The expanded range of available walking speeds could permit users to better avoid obstacles and naturally adapt to various environments. Further research is required to definitively determine the robustness, generalizability, and functional implications of these results.
   Publication type: Journal: Conference Paper
   Source: EMBASE
   Full text: Available Salisbury EJournals at Journal of Spinal Cord Medicine

3. Title: A prospective, longitudinal, descriptive study of the effect of a customized wheelchair cushion on clinical
variables, satisfaction, and functionality among patients with spinal cord injury.

Citation: Ostomy Wound Management, February 2015, vol./is. 61/2(26-36), 0889-5899;1943-2720 (2015 Feb)
Author(s): Vilchis-Aranguren R, Gayol-Merida D, Quinzanos-Fresnedo J, Perez-Zavaia R, Galindez-Novoa C
Language: English
Abstract: The Instituto Nacional de Rehabilitacion (Rehabilitation National Institute) (INR) developed a prototype wheelchair cushion (INR cushion) designed to adjust to the anthropometry of the user's ischiogluteal area and prevent pressure ulcer formation while maintaining or promoting functionality. A prospective, longitudinal, descriptive study was conducted from February 2010 to February 2011 to evaluate the effect of using the INR cushion on clinical variables, functionality, and user satisfaction. Sixteen patients were recruited (9 male, 7 female, average age 31.8 [range 22-47] years, average body mass index 25 [range 22-34], average time in a wheelchair 10.1 [range 3-26] years) who met the study protocol inclusion criteria of being pressure ulcer-free for at least 6 months and capable of propulsion and transfer without assistance, chronic spinal cord injury (>2 years), and without chronic-degenerative diseases or cognitive problems. Each participant received the cushion for a 2-month evaluation. Eight clinical variables were assessed: trunk control, posture, spasticity, transfer capacity, comfort, skin reaction, propulsion capacity, and pressure release capacity. The clinical assessment was performed using validated scales and instruments: Modified Ashworth Scale (MAS), Functional Independence Measure (FIM), Norton Scale, and assessment of skin reaction. Interface pressures were measured using force sensing array, and participants completed a structured interview to assess user expectation, perceived functionality, perceived quality, and likelihood of recommending the device. Two patients withdrew due to appointment conflicts; of the remaining 14, significant differences between the user's experience with other products and the INR were found with regard to pressure redistribution (P = 0.012); all participants but 1 graded the INR as good in all interview categories. No participants developed a pressure ulcer during the study. The customized cushion was especially functional among patients with incomplete thoracic and cervical injuries, high FIM scores, and moderate levels of activities of daily living. Taller patients (P = 0.01) and patients with higher degrees of spasticity (P = 0.007) were less satisfied with functionality. The results of this study contributed to the redesign process of the cushion. These findings may be useful to establish predictors, both subjective and clinical, for patient utilization of wheelchair cushion use.

Publication type: Journal Article
Source: MEDLINE

4. Title: Acute complications of spinal cord injuries.
Citation: World Journal of Orthopedics, January 2015, vol./is. 6/1(17-23), 2218-5836;2218-5836 (2015 Jan 18)
Author(s): Hagen EM
Language: English
Abstract: The aim of this paper is to give an overview of acute complications of spinal cord injury (SCI). Along with motor and sensory deficits, instabilities of the cardiovascular, thermoregulatory and broncho-pulmonary system are common after a SCI. Disturbances of the urinary and gastrointestinal systems are typical as well as sexual dysfunction. Frequent complications of cervical and high thoracic SCI are neurogenic shock, bradyarrhythmias, hypotension, ectopic beats, abnormal temperature control and disturbance of sweating, vasodilatation and autonomic dysreflexia. Autonomic dysreflexia is an abrupt, uncontrolled sympathetic response, elicited by stimuli below the level of injury. The symptoms may be mild like skin rash or slight headache, but can cause severe hypertension, cerebral haemorrhage and death. All personnel caring for the patient should be able to recognize the symptoms and be able to intervene promptly. Disturbance of respiratory function are frequent in tetraplegia and a primary cause of both short and long-term morbidity and mortality is pulmonary complications. Due to physical inactivity and altered haemostasis, patients with SCI have a higher risk of venous thromboembolism and pressure ulcers. Spasticity and pain are frequent complications which need to be addressed. The psychological stress associated with SCI may lead to anxiety and depression. Knowledge of possible complications during the acute phase is important because they may be life threatening and/or may lead to prolonged rehabilitation.

Publication type: Journal Article, Review
Source: MEDLINE

5. Title: Assessing pain intensity following spinal cord injury: should rating scales measure 'overall' or 'maximal' values?
Citation: International Journal of Rehabilitation Research, March 2015, vol./is. 38/1(92-4), 0342-5282;1473-5660 (2015 Mar)
Author(s): Frank AO, Spyridonis F, Ghinea G
Language: English
Abstract: Rating scales (RSs) are important for the assessment of pain intensity (PI) following a spinal cord injury (SCI). Using a Graphic Rating Scale, this pilot study measured an 'overall' level of PI repeated about every 2h over 1 day and compared it with maximal PI scores reported previously. Patients were categorized into severity groups according to the overall Graphic Rating Scale score at initial assessment (T0). Eight men and six women (mean age 53.1; range 28-75) participated. Comparison of the overall PI scores and their changes over time with the maximal PI scores reported previously showed loss of patients in the severe group and less pronounced PI changes over time. Rating scales used in
spinal cord injury services should measure maximal pain experienced 'right now' to eliminate potential averaging out of pain over time, which might allow physicians to assist patients in understanding their pain and begin their adjustment.

**Publication type:** Journal Article  
**Source:** MEDLINE

6. **Title:** Assessment of abdominal muscle function in individuals with motor-complete spinal cord injury above T6 in response to transcranial magnetic stimulation.  
**Citation:** Journal of Rehabilitation Medicine, January 2015, vol./is. 47/2(138-46), 1650-1977;1651-2081 (2015 Jan 27)  
**Author(s):** Bjerkefors A, Squair JW, Chua R, Lam T, Chen Z, Carpenter MG  
**Language:** English  
**Abstract:** OBJECTIVE: To use transcranial magnetic stimulation and electromyography to assess the potential for preserved function in the abdominal muscles in individuals classified with motor-complete spinal cord injury above T6. SUBJECTS: Five individuals with spinal cord injury (CS-T3) and 5 able-bodied individuals. METHODS: Transcranial magnetic stimulation was delivered over the abdominal region of primary motor cortex during resting and sub-maximal (or attempted) contractions. Surface electromyography was used to record motor-evoked potentials as well as maximal voluntary (or attempted) contractions in the abdominal muscles and the diaphragm. RESULTS: Responses to transcranial magnetic stimulation in the abdominal muscles occurred in all spinal cord injury subjects. Latencies of muscle response onsets were similar in both groups; however, peak-to-peak amplitudes were smaller in the spinal cord injury group. During maximal voluntary (or attempted) contractions all spinal cord injury subjects were able to elicit electromyography activity above resting levels in more than one abdominal muscle across tasks. CONCLUSION: Individuals with motor-complete spinal cord injury above T6 were able to activate abdominal muscles in response to transcranial magnetic stimulation and during maximal voluntary (or attempted) contractions. The activation was induced directly through corticospinal pathways, and not indirectly by stretch reflex activations of the diaphragm. Transcranial magnetic stimulation and electromyography measurements provide a useful method to assess motor preservation of abdominal muscles in persons with spinal cord injury.  
**Publication type:** Journal Article  
**Source:** MEDLINE

7. **Title:** Assessment of hyperactive reflexes in patients with spinal cord injury.  
**Citation:** BioMed Research International, 2015, vol./is. 2015/(149875), 2314-6141 (2015)  
**Author(s):** Xu D, Guo X, Yang CY, Zhang LQ  
**Language:** English  
**Abstract:** Hyperactive reflexes are commonly observed in patients with spinal cord injury (SCI) but there is a lack of convenient and quantitative characterizations. Patellar tendon reflexes were examined in nine SCI patients and ten healthy control subjects by tapping the tendon using a hand-held instrumented hammer at various knee flexion angles, and the tapping force, quadriceps EMG, and knee extension torque were measured to characterize patellar tendon reflexes quantitatively in terms of the tendon reflex gain (G tr), contraction rate (R c ), and reflex loop time delay (t d ). It was found that there are significant increases in G tr and R c and decrease in t d in patients with spinal cord injury as compared to the controls (P < 0.05). This study presented a convenient and quantitative method to evaluate reflex excitability and muscle contraction dynamics. With proper simplifications, it can potentially be used for quantitative diagnosis and outcome evaluations of hyperreflexia in clinical settings.  
**Publication type:** Journal Article  
**Source:** MEDLINE

8. **Title:** Attending to biographical disruption: the experience of rehabilitation following tetraplegia due to spinal cord injury.  
**Citation:** Disability & Rehabilitation, 2015, vol./is. 37/4(296-303), 0963-8288;1464-5165 (2015)  
**Author(s):** Bourke JA, Hay-Smith EJ, Snell DL, DeJong G  
**Language:** English  
**Abstract:** UNLABELLED: Abstract Purpose: To explore the experience of rehabilitation from the perspective of individuals with tetraplegia. METHODS: Semi-structured interviews of between 40 and 60 min were conducted with three men and one woman, with spinal injuries at C7 or higher, within 6 months of discharge from inpatient spinal cord injury (SCI) rehabilitation. Data were subject to an Interpretive Phenomenological Analysis (IPA). RESULTS: Participants described their injuries as more than a biological impairment that limited certain functional abilities. For them, SCI was a sudden event that also disrupted one's "life biography". Interviews uncovered three key themes essential to an individual's ability to restore feelings of self-agency and biographical continuity: The importance of information, regaining control, and restoring a sense of personal narrative. CONCLUSION: Findings from studies using IPA have much to contribute to discussion and debate at the level of rehabilitation theory and can guide future research directions. The findings of the present study support a growing body of literature that argues that rehabilitation research needs to focus more intensely on the biographical disruption caused by SCI. Implications for Rehabilitation Participants in the present study experienced a
significant disruption to their biographical narratives following a SCI as they entered an unknown and uncertain world. The findings from the present study provide an evidence-base that is best applied to discussion regarding psychosocial adjustment at the level rehabilitation theory. The concepts of identity and biographical disruption are appearing more frequently in qualitative literature and both merit further investigation to assess their prevalence among the wider SCI populations.

**Publication type:** Journal Article  
**Source:** MEDLINE

9. **Title:** Biphasic bisperoxovanadium administration and Schwann cell transplantation for repair after cervical contusive spinal cord injury  
**Citation:** Experimental Neurology, February 2015, vol./is. 264/(163-172), 0014-4886;1090-2430 (February 01, 2015)  
**Author(s):** Walker C.L., Wang X., Bullis C., Liu N.-K., Lu Q., Fry C., Deng L., Xu X.-M.  
**Language:** English  
**Abstract:** Schwann cells (SCs) hold promise for spinal cord injury (SCI) repair; however, there are limitations for its use as a lone treatment. We showed that acute inhibition of the phosphatase and tensin homolog deleted on chromosome ten (PTEN) by bisperoxovanadium (bpV) was neuroprotective and enhanced function following cervical hemicontusion SCI. We hypothesized that combining acute bpV therapy and delayed SC engraftment would further improve neuroprotection and recovery after cervical SCI. Adult female Sprague-Dawley (SD) rats were randomly sorted into 5 groups: sham, vehicle, bpV, SC transplantation, and bpV+SC transplantation. SCs were isolated from adult green fluorescent protein (GFP)-expressing SD rats (GFP-SCs). 200μg/kg bpV(pic) was administered intraperitoneally (IP) twice daily for 7days post-SCI in bpV-treated groups. GFP-SCs (1x10^6) were transplanted into the lesion epicenter at the 8th day post-SCI. Forelimb function was tested for 10weeks and histology was assessed. bpV alone significantly reduced lesion (by 40%, p<0.05) and cavitation (by 65%, p<0.05) and improved functional recovery (p<0.05) compared to injury alone. The combination promoted similar neuroprotection (p<0.01 vs. injury); however, GFP-SCs alone did not. Both SC-transplanted groups exhibited remarkable long-term SC survival, SMI-31<sup>+</sup> axon ingrowth, and RECA-1<sup>+</sup> vasculature presence in the SC graft; however, bpV+SCs promoted an 89% greater axon-to-lesion ratio than SCs only. We concluded that bpV likely contributed largely to the neuroprotective and functional benefits while SCs facilitated considerable host-tissue interaction and modification. The combination of the two shows promise as an attractive strategy to enhance recovery after SCI.  
**Publication type:** Journal: Article  
**Source:** EMBASE  
**Full text:** Available Elsevier at [Experimental Neurology](https://www.sciencedirect.com/science/article/pii/S0014488615002005)

10. **Title:** Botulinum toxin in urology  
**Citation:** Toxicon, January 2015, vol./is. 93/(S15), 0041-0101 (January 2015)  
**Author(s):** Chancellor M.B., Smith C.P.  
**Language:** English  
**Abstract:** Onabotulinumtoxin A (onaBoNTA; Botox) received regulatory approval from the US Food and Drug Administration (FDA) for treatment of urinary incontinence (UI) due to neurogenic detrusor overactivity (NDO) in 2011. A total of 691 patients with spinal cord injury or multiple sclerosis who had an inadequate response to or were intolerant of one or more anticholinergic medications were enrolled in the 2 pivotal phase 3 studies. These patients were randomized to receive 200 units (U) of onaBoNTA (n=227), 300 U of onaBoNTA (n=223), or placebo (n=241). In both studies, significant improvement in the primary efficacy variable of change from baseline in weekly frequency of UI episodes was achieved with 200 U of onaBoNTA compared with placebo. Improvement was seen after 2 weeks, and the average duration of response was approximately 10 months. Among patients who were not catheterized at baseline, catheterization for urinary retention (which is a temporary inability to fully empty the bladder, requiring clean intermittent catheterization) was initiated in 30.6% of patients following treatment with 200 U of onaBoNTA vs 6.7% of those on placebo. In an exciting new development, positive data in a phase 2 study of abobotulinumtoxin A (Dysport) in patients with NDO has been reported in 2014. OnaBoNTA also received FDA approval for treatment of idiopathic detrusor overactivity (IDO) in 2013. Phase 3 studies demonstrated the safety and efficacy of onaBoNTA in patients with overactive bladder (OAB) whose symptoms were not adequately managed with anticholinergic medications. OnaBoNTA reduced the daily frequency of urinary leakage episodes from baseline by approximately 50% or more by week 12 compared with placebo. The efficacy of onaBoNTA in reducing urinary leakage and other OAB symptoms lasted up to 6 months. The most common side effects reported with onaBoNTA treatment in clinical studies included urinary tract infection (18% vs 6% with placebo), dysuria (ie, painful or difficult urination; 9% vs 7% with placebo), and urinary retention (6% vs 0% with placebo). Urinary retention was more likely to develop in patients with diabetes mellitus treated with onaBoNTA.  
**Publication type:** Journal: Conference Abstract  
**Source:** EMBASE  
**Full text:** Available Elsevier at [Toxicon](https://www.sciencedirect.com/science/article/pii/S0041010115002208)
11. Title: Chronic complications of spinal cord injury.
Citation: World Journal of Orthopedics, January 2015, vol./is. 6/1(24-33), 2218-5836;2218-5836 (2015 Jan 18)
Author(s): Sezer N, Akkus S, Ugurlu FG
Language: English
Abstract: Spinal cord injury (SCI) is a serious medical condition that causes functional, psychological and socioeconomic disorder. Therefore, patients with SCI experience significant impairments in various aspects of their life. The goals of rehabilitation and other treatment approaches in SCI are to improve functional level, decrease secondary morbidity and enhance health-related quality of life. Acute and long-term secondary medical complications are common in patients with SCI. However, chronic complications especially further negatively impact on patients' functional independence and quality of life. Therefore, prevention, early diagnosis and treatment of chronic secondary complications in patients with SCI is critical for limiting these complications, improving survival, community participation and health-related quality of life. The management of secondary chronic complications of SCI is also important for SCI specialists, families and caregivers as well as patients. In this paper, we review data about common secondary long-term complications after SCI, including respiratory complications, cardiovascular complications, urinary and bowel complications, spasticity, pain syndromes, pressure ulcers, osteoporosis and bone fractures. The purpose of this review is to provide an overview of risk factors, signs, symptoms, prevention and treatment approaches for secondary long-term complications in patients with SCI.
Publication type: Journal Article, Review
Source: MEDLINE

12. Title: Current and future medical therapeutic strategies for the functional repair of spinal cord injury.
Citation: World Journal of Orthopedics, January 2015, vol./is. 6/1(42-55), 2218-5836;2218-5836 (2015 Jan 18)
Author(s): Yilmaz T, Kaptanoglu E
Language: English
Abstract: Spinal cord injury (SCI) leads to social and psychological problems in patients and requires costly treatment and care. In recent years, various pharmacological agents have been tested for acute SCI. Large scale, prospective, randomized, controlled clinical trials have failed to demonstrate marked neurological benefit in contrast to their success in the laboratory. Today, the most important problem is ineffectiveness of nonsurgical treatment choices in human SCI that showed neuroprotective effects in animal studies. Recently, attempted cellular therapy and transplantsations are promising. A better understanding of the pathophysiology of SCI started in the early 1980s. Research had been looking at neuroprotection in the 1980s and the first half of 1990s and regeneration studies started in the second half of the 1990s. A number of studies on surgical timing suggest that early surgical intervention is safe and feasible, can improve clinical and neurological outcomes and reduce health care costs, and minimize the secondary damage caused by compression of the spinal cord after trauma. This article reviews current evidence for early surgical decompression and nonsurgical treatment options, including pharmacological and cellular therapy, as the treatment choices for SCI.
Publication type: Journal Article, Review
Source: MEDLINE

13. Title: Current and future surgery strategies for spinal cord injuries.
Citation: World Journal of Orthopedics, January 2015, vol./is. 6/1(34-41), 2218-5836;2218-5836 (2015 Jan 18)
Author(s): Dalbayrak S, Yaman O, Yilmaz T
Language: English
Abstract: Spinal cord trauma is a prominent cause of mortality and morbidity. In developed countries a spinal cord injury (SCI) occurs every 16 min. SCI occurs due to tissue destruction, primarily by mechanical and secondarily ischemic. Primary damage occurs at the time of the injury. It cannot be improved. Following the primary injury, secondary harm mechanisms gradually result in neuronal death. One of the prominent causes of secondary harm is energy deficit, emerging from ischemia, whose main cause in the early stage, is impaired perfusion. Due to the advanced techniques in spinal surgery, SCI is still challenging for surgeons. Spinal cord doesn’t have a self-repair property. The main damage occurs at the time of the injury primarily by mechanical factors that cannot be improved. Secondarily mechanisms take part in the following sections. Spinal compression and neurological deficit are two major factors used to decide on surgery. According to advanced imaging techniques the classifications systems for spinal injury has been changed in time. Aim of the surgery is to decompress the spinal channel and to restore the spinal alinement and mobilize the patient as soon as possible. Use of neuroprotective agents as well as methods to achieve cell regeneration in addition to surgery would contribute to the solution.
Publication type: Journal Article, Review
Source: MEDLINE

14. Title: Current states of endogenous stem cells in adult spinal cord
Citation: Journal of Neuroscience Research, March 2015, vol./is. 93/3(391-398), 0360-4012;1097-4547 (01 Mar 2015)
Author(s): Qin Y., Zhang W., Yang P.
Language: English
**Abstract:** New neurons are continuously generated throughout life in the subgranular zone in the dentate gyrus of the mammalian hippocampus and in the subventricular zone of the lateral ventricles. With the aid of new methodologies, significant progress has been made in the characterization of endogenous stem cells (ependymal cells) and their development in the adult spinal cord. Recent studies have shed light on essential extrinsic and intrinsic molecular mechanisms that govern sequential steps of neurogenesis in the adult spinal cord. This review discusses the occurrence, origin, and specific makers of ependymal cells; the factors regulating neurogenesis of multipotent ependymal cells; and the implications of ependymal cells in the repair of spinal cord injuries.

**Publication type:** Journal: Article

**Source:** EMBASE

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15. **Title:** Decreases in bone mineral density at cortical and trabecular sites in the tibia and femur during the first year of spinal cord injury

**Citation:** Bone, May 2015, vol./is. 74/(69-75), 8756-3282 (May 01, 2015)

**Author(s):** Coupaud S., McLean A.N., Purcell M., Fraser M.H., Allan D.B.

**Language:** English

**Abstract:** Background: Disuse osteoporosis occurs in response to long-term immobilization. Spinal cord injury (SCI) leads to a form of disuse osteoporosis that only affects the paralyzed limbs. High rates of bone resorption after injury are evident from decreases in bone mineral content (BMC), which in the past have been attributed in the main to loss of trabecular bone in the epiphyses and cortical thinning in the shaft through endocortical resorption. Methods: Patients with motor-complete SCI recruited from the Queen Elizabeth National Spinal Injuries Unit (Glasgow, UK) were scanned within 5 weeks of injury (baseline) using peripheral Quantitative Computed Tomography (pQCT). Unilateral scans of the tibia, femur and radius provided separate estimates of trabecular and cortical bone parameters in the epiphyses and diaphyses, respectively. Using repeat pQCT scans at 4, 8 and 12 months post-injury, changes in BMC, bone mineral density (BMD) and cross-sectional area (CSA) of the bone were quantified. Results: Twenty-six subjects (5 female, 21 male) with SCI (12 paraplegic, 14 tetraplegic) were enrolled into the study. Repeated-measures analyses showed a significant effect of time since injury on key bone parameters at the epiphyses of the tibia and femur (BMC, total BMD, trabecular BMC) and their diaphyses (BMC, cortical BMD, cortical CSA). There was no significant effect of gender or age on key outcome measures, but there was a tendency for the female subjects to experience greater decreases in cortical BMD. The decreases in cortical BMD in the tibia and femur were found to be statistically significant in both men and women. Conclusions: By carrying out repeat pQCT scans at four-monthly intervals, this study provides a uniquely detailed description of the cortical bone changes that occur alongside trabecular bone changes in the first year of complete SCI. Significant decreases in BMD were recorded in both the cortical and trabecular bone compartments of the tibia and femur throughout the first year of injury. This study provides evidence for the need for targeted early intervention to preserve bone mass within this patient group.

**Publication type:** Journal: Article

**Source:** EMBASE

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16. **Title:** Dermatological problems following spinal cord injury in Korean patients

**Citation:** Journal of Spinal Cord Medicine, January 2015, vol./is. 38/1(63-67), 1079-0268;2045-7723 (01 Jan 2015)

**Author(s):** Han Z.-A., Choi J.Y., Ko Y.J.

**Language:** English

**Abstract:** Objective: To identify dermatological conditions following spinal cord injury (SCI) and analyze these conditions in relation to various characteristics of SCI. Design: Retrospective chart review. Setting: National Health Insurance Corporation Ilsan Hospital of Korea, Rehabilitation Center, Spinal Cord Unit. Participants: Patients treated for SCI who were referred to dermatology for dermatological problems after SCI. Results: Of the 1408 SCI patients treated at the spinal cord unit, 253 patients with SCI were identified to have been referred to dermatology for skin problems and a total of 335 dermatological conditions were diagnosed. The most common dermatological finding was infectious (n = 123, 36.7%) followed by eczematous lesions (n = 109, 32.5%). Among the infectious lesions, fungal infection (n = 76, 61.8%) was the most common, followed by bacterial (n = 27, 21.9%) lesions. Seborrheic dermatitis (n= 59, 64.1%) was the most frequent eczematous lesion. Ingrown toenail occurred more frequently in tetraplegics whereas vascular skin lesions occurred more commonly in patients with paraplegia (P < 0.05). Xerotic dermatitis showed a higher occurrence within 12 months of injury rather than thereafter (P < 0.05). Of these, 72.4% of the infectious and 94.7% of the fungal skin lesions manifested below the neurological level of injury (NNL; P < 0.001) and 61.5% of the eczematous lesions and 94.9% of seborrheic dermatitis cases occurred above the NNL (P< 0.001). There was no significant difference in dermatological diagnoses between patients with neurologically complete and incomplete SCI. Conclusion: The most common dermatological condition in patients with SCI among those referred to dermatology was fungal infection, followed by seborrheic dermatitis. Although dermatological problems after SCI are not critical in SCI outcome, they negatively affect the quality of life. Patients and caregivers should be educated about appropriate skin care and routine dermatological examinations.

**Publication type:** Journal: Conference Paper
17. Title: Diagnostic accuracy of common clinical tests for assessing abdominal muscle function after motor-complete spinal cord injury above T6.

Citation: Spinal Cord, February 2015, vol./is. 53/2(114-9), 1362-4393;1476-5624 (2015 Feb)

Author(s): Bjerkefors A, Squair JW, Malik R, Lam T, Chen Z, Carpenter MG

Language: English

Abstract: STUDY DESIGN: Diagnostic study OBJECTIVES: The objective of this study was to compare patterns of electromyography (EMG) recordings of abdominal muscle function in persons with motor-complete spinal cord injury (SCI) above T6 and in able-bodied controls, and to determine whether manual examination or ultrasound measures of muscle activation can be accurate alternatives to EMG. SETTING: Research center focused on SCI and University laboratory, Vancouver, Canada. METHODS: Thirteen people with SCI (11 with American Spinal Injury Association Impairment Scale (AIS) A and 2 AIS B; C4-T5), and 13 matched able-bodied participants volunteered for the study. Participants completed trunk tasks during manual examination of the abdominal muscles and then performed maximal voluntary isometric contractions, while EMG activity and muscle thickness changes were recorded. The frequency of muscle responses detected by manual examination and ultrasound were compared with detection by EMG (sensitivity and specificity). RESULTS: All individuals with SCI were able to elicit EMG activity above resting levels in at least one abdominal muscle during one task. In general, the activation pattern was task specific, confirming voluntary control of the muscles. Ultrasound, when compared with EMG, showed low sensitivity but was highly specific in its ability to detect preserved abdominal muscle function in persons with SCI. Conversely, manual examination was more sensitive than ultrasound but showed lower specificity. CONCLUSION: The results from this study confirm preserved voluntary abdominal muscle function in individuals classified with motor-complete SCI above T6 and highlight the need for further research in developing more accurate clinical measures to diagnose the level of trunk muscle preservation in individuals with SCI.

Publication type: Journal Article

Source: MEDLINE

Full text: Available Nature Publishing Group at Spinal Cord

18. Title: Differences in bone mineral density, markers of bone turnover and extracellular matrix and daily life muscular activity among patients with recent motor-complete versus motor-complete spinal cord injury.

Citation: Calcified Tissue International, February 2015, vol./is. 96/2(145-54), 0171-967X;1432-0827 (2015 Feb)

Author(s): Kostovski E, Hjeltnes N, Eriksen EF, Kolset SO, Iversen PO

Language: English

Abstract: Spinal cord injury (SCI) leads to severe bone loss, but the associated mechanisms are poorly described in incomplete SCI individuals. The purpose of the study is to compare alterations in bone mineral density (BMD) and serum biomarkers of bone turnover in recent motor-complete SCI men, as well as to describe their physical activity and spasticity. We studied 31 men with acute SCI. Whole-body DXA scans, serum biomarkers and self-reported activity and spasticity were examined 1 and/or 3 and 12 months after the injury. We observed a decrease in proximal femur BMD (p < 0.02) in both the groups. Serum phosphate and carboxy-terminal-collagen crosslinks were significantly lower in motor-complete versus complete SCI men, whereas albumin-corrected Ca(2+) (p = 0.02) were lower only 3 months after injury. When data from all 31 SCI participants were pooled, we observed increased serum matrix metalloproteinase-2 (MMP-2) and tissue inhibitors of MMP-2 (TIMP-2) (p < 0.02) whereas TIMP-1 decreased (p = 0.03). BMD correlated positively with self-reported activity (r = 0.59, p = 0.04) and negatively with spasticity (r = 0.74, p = 0.02) 12 months after injury. As a summary, men with motor-complete SCI developed significant proximal femur bone loss 12 months after injury and exhibited increased bone resorption throughout the first year after the injury. Compared with complete SCI men, incomplete SCI men show attenuated bone resorption. Our pooled data show increased turnover of extracellular matrix after injury and that increased exercise before and after injury correlated with reduced bone loss.

Publication type: Journal Article

Source: MEDLINE

Full text: Available Salisbury EJournals at Journal of Spinal Cord Medicine

19. Title: Differences in quality of life outcomes among depressed spinal cord injury trial participants

Citation: Archives of Physical Medicine and Rehabilitation, February 2015, vol./is. 96/2(340-348), 0003-9993;1532-821X (01 Feb 2015)

Author(s): Tate D.G., Forchheimer M., Bombardier C.H., Heinemann A.W., Neumann H.D., Fann J.R.

Language: English

Abstract: Objective To assess the role that treatment response plays in a randomized controlled trial of an antidepressant among people with spinal cord injury (SCI) diagnosed with major depressive disorder (MDD) in explaining quality of life (QOL), assessed both globally as life satisfaction and in terms of physical and mental health-related QOL. Design Multivariable analyses were conducted, controlling for demographic, neurologic, and participatory factors and perceived functional limitations. Setting Rehabilitation centers. Participants Of the 133 persons who were randomized into the
Project to Improve Symptoms and Mood after Spinal Cord Injury randomized controlled trial, 124 participated in this study. All participants were between the ages of 18 and 64 years, at least 1 month post-SCI, met the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, criteria for MDD, and completed the core measures used in this study. Interventions Not applicable. Main Outcome Measures The Satisfaction with Life Scale and the physical and mental component summary scores of the Medical Outcomes Study 12-Item Short-Form Health Survey. Results Reduction in depressive symptoms over the course of a 12-week trial was predictive of increased QOL, which was measured as life satisfaction and mental well-being, within the context of other explanatory factors. However, reduction in symptoms did not explain differences in physical well-being among those with MDD. Perceived functional disability explained all 3 indices of QOL. Conclusions Greater recognition has been given to QOL outcomes as endpoints of clinical trials because these often reflect participants' reported outcomes. Our findings support the association of QOL to the reduction of depression symptoms among trial participants. This association differs depending on how QOL is defined and measured, with stronger relations observed with life satisfaction and mental well-being among those diagnosed with MDD. The lack of association between depression and physical well-being may be explained by participants' subjective interpretation of physical well-being after SCI and their expectations and perceptions of improved physical health-related QOL based on the use of assistive technology. Consistent with our findings, pain is likely to play a role in decreasing physical QOL among those with incomplete injuries. Practicing caution is suggested in using physical well-being as an endpoint in trials among people with SCI.

Publication type: Journal: Article
Source: EMBASE
Full text: Available ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION at Archives of Physical Medicine and Rehabilitation
Full text: Available ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION at Salisbury District Hospital Healthcare Library

20.Title: Dysregulation of Kv3.4 channels in dorsal root ganglia following spinal cord injury
Citation: Journal of Neuroscience, January 2015, vol./is. 35/3(1260-1273), 0270-6474;1529-2401 (21 Jan 2015)
Author(s): Ritter D.M., Zemel B.M., Hala T.J., O'Leary M.E., Lepore A.C., Covarrubias M.
Language: English
Abstract: Spinal cord injury (SCI) patients develop chronic pain involving poorly understood central and peripheral mechanisms. Because dysregulation of the voltage-gated Kv3.4 channel has been implicated in the hyperexcitable state of dorsal root ganglion (DRG) neurons following direct injury of sensory nerves, we asked whether such a dysregulation also plays a role in SCI. Kv3.4 channels are expressed in DRG neurons, where they help regulate action potential (AP) repolarization in a manner that depends on the modulation of inactivation by protein kinase C (PKC)-dependent phosphorylation of the channel's inactivation domain. Here, we report that, 2 weeks after cervical hemicontusion SCI, injured rats exhibit contralateral hypersensitivity to stimuli accompanied by accentuated repetitive spiking in putative DRG nociceptors. Also in these neurons at 1 week after laminectomy and SCI, Kv3.4 channel inactivation is impaired compared with naive nonsurgical controls. At 2-6 weeks after laminectomy, however, Kv3.4 channel inactivation returns to naive levels. Conversely, Kv3.4 currents at 2-6 weeks post-SCI are downregulated and remain slow-inactivating. Immunohistochemistry indicated that downregulation mainly resulted from decreased surface expression of the Kv3.4 channel, as whole-DRG-protein and single-cell mRNA transcript levels did not change. Furthermore, consistent with Kv3.4 channel dysregulation, PKC activation failed to shorten the AP duration of small-diameter DRG neurons. Finally, re-expressing synthetic Kv3.4 currents under dynamic clamp conditions dampened repetitive spiking in the neurons from SCI rats. These results suggest a novel peripheral mechanism of post-SCI pain sensitization implicating Kv3.4 channel dysregulation and potential Kv3.4-based therapeutic interventions.
Publication type: Journal: Article
Source: EMBASE

21.Title: Effect of Long-Term Physical Activity and Acute Exercise on Markers of Systemic Inflammation in Persons With Chronic Spinal Cord Injury: A Systematic Review.
Citation: Archives of Physical Medicine & Rehabilitation, 01 January 2015, vol./is. 96/1(30-42), 00039993
Author(s): Neefkes-Zonneveld, Céline R., Bakkum, Arjan J., Bishop, Nicolette C., van Tulder, Maurits W., Janssen, Thomas W.
Language: English
Abstract: Objective: To evaluate the effect of long-term physical activity (PA) and acute exercise on markers of systemic inflammation in persons with chronic spinal cord injury (SCI). Data Sources: We searched PubMed (MEDLINE), EMBASE, Central Register of Controlled Trials, CINAHL, and PEDro, involving variations of the Medical Subject Headings: SCI, PA, exercise, and inflammation. No time or language restrictions were applied. Study Selection: Except for case reports, we included any type of study, both sexes, all ages, with SCI, resulting in the inclusion of 11 studies. PA included leisure or work activity, including exercise. Data Extraction: Two authors independently scanned titles and abstracts and read the articles included. One author extracted and the second double-checked the data. The methodological quality and evidence
were rated by using the Cochrane Risk of Bias tool or the Newcastle-Ottawa Scale and the Grading of Recommendations Assessment, Development and Evaluation approach. Data Synthesis: The included studies had a high risk of bias and “very low” levels of evidence. Meta-analyses were performed (random-effects model or generic inverse variance method). The acute interleukin-6 (IL-6) response to exercise was the same for individuals with SCI and able-bodied individuals (P=.91); however, responses were higher in those with paraplegia than in those with tetraplegia (weighted mean difference, 1.19, P<.0001, and 0.25, P=.003, respectively). Compared with physically inactive people with SCI, physically active people with SCI had lower plasma C-reactive protein (CRP) levels (weighted mean difference, −0.38; P=.009). CRP concentrations were lower after the exercise intervention than before the exercise intervention (weighted mean difference, −2.76; P=.0001).

Conclusions: PA and exercise may improve systemic markers of low-grade inflammation in those with SCI, particularly IL-6 and CRP. The change in IL-6 and CRP levels seems to be greater in those with paraplegia than in those with tetraplegia.

Publication type: journal article
Source: CINAHLL
Full text: Available ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION at Archives of Physical Medicine and Rehabilitation
Full text: Available ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION at Salisbury District Hospital Healthcare Library

22. Title: Effects of transcutaneous electrical nerve stimulation on pain in patients with spinal cord injury: a randomized controlled trial.
Citation: Journal of Physical Therapy Science, 01 January 2015, vol./is. 27/1(23-25), 09155287
Author(s): Xia Bi, Hong Lv, Bin-Lin Chen, Xin Li, Xue-Qiang Wang
Language: English
Abstract: [Purpose] To investigate the effects of transcutaneous electrical nerve stimulation (TENS) on pain in patients with spinal cord injury. [Subjects and Methods] Fifty-two spinal cord injury patients with central pain were randomly allocated into two groups TENS and control with 26 subjects per group. The patients in TENS and control groups were treated with TENS and sham TENS for 20 min (three times a week) for 12 consecutive weeks, respectively. The two group’s pain was assessed using visual analog scale (VAS) and the McGill Pain Questionnaire (including pain rating index-total, pain rating index-affective, pain rating index-sensory, present pain intensity, and number of words chosen) before and after the treatment. [Results] After the intervention, we found significant differences in VAS, pain rating index-total, pain rating index-affective, pain rating index-sensory, present pain intensity, and number of words chosen between the TENS group and the control group. [Conclusion] Our results suggest that TENS effectively decreases pain in patients with spinal cord injury.
Publication type: journal article
Source: CINAHLL

23. Title: Enhanced expression of neurotrophic factors in the injured spinal cord through vaccination with myelin basic protein-derived peptide pulsed dendritic cells
Citation: Spine, January 2015, vol./is. 40/2(95-101), 0362-2436;1528-1159 (15 Jan 2015)
Author(s): Wang Y., Li J., Kong P., Zhao S., Yang H., Chen C., Yan J.
Language: English
Abstract: STUDY DESIGN.: Vaccination of spinal cord injury (SCI) mice with myelin basic protein-derived peptide (A91) pulsed dendritic cells (DC) to enhance brain-derived neurotrophic factor and neurotrophin-3 (NT-3) expression in injured spinal cord.OBJECTIVE.: To investigate the effect of A91-pulsed DC (A91-DC) on expression of neurotrophic factor in injured spinal cord.SUMMARY OF BACKGROUND DATA.: SCI leads to progressive secondary tissue degeneration, and no satisfactory treatment is currently available. Accumulating evidence indicates that administration of neurotrophic factors to injured spinal cord is partially successful at promoting nerve tissue repair. However, most of strategy can cause secondary injury and limiting their wide clinical application.METHODS.: Proliferation of T cells and the capability of CD4 T cells to secret neurotrophic factors were first measured in vitro to demonstrate the stimulation action of the A91-DC. In SCI mice model, enzyme-linked immunosorbent assay and immunofluorescence was employed to investigate the brain-derived neurotrophic factor and NT-3 expression in injured spinal cord. Furthermore, the neuroprotective effect of A91-DC in injured spinal cord was examined through histology measurement.RESULTS.: In this study, we demonstrated that A91-DC promoted the capability of T cells to secret neurotrophic factors and in the subacute phase of SCI. Moreover, vaccination with A91-DC enhanced the expression level of brain-derived neurotrophic factor and NT-3 and exerted neuroprotective effect in injured spinal cord.CONCLUSION.: The findings of study demonstrate that the therapeutic strategy of vaccination A91-DC is a potential minimally invasive approach that could provide strong neurotrophic factor support after SCI.
Publication type: Journal: Article
Source: EMBASE
Full text: Available Ovid at Spine
Full text: Available Ovid at Spine
24. **Title:** Extending technology-aided leisure and communication programs to persons with spinal cord injury and post-coma multiple disabilities.

**Citation:** Disability & Rehabilitation Assistive Technology, January 2015, vol./is. 10(1)(32-7), 1748-3107;1748-3115 (2015 Jan)

**Author(s):** Lancioni GE, Singh NN, O'Reilly MF, Sigafoos J, Ricciuti RA, Trignani R, Oliva D, Signorino M, D'Amico F, Sasanelli G

**Language:** English

**Abstract:** PURPOSE: These two studies extended technology-aided programs to promote leisure and communication opportunities to a man with cervical spinal cord injury and a post-coma man with multiple disabilities. METHOD: The studies involved the use of ABAB designs, in which A and B represented baseline and intervention phases, respectively. The programs focused on enabling the participants to activate songs, videos, requests, text messages, and telephone calls. These options were presented on a computer screen and activated through a small pressure microswitch by the man with spinal cord injury and a special touch screen by the post-coma man. To help the latter participant, who had no verbal skills, with requests and telephone calls, series of words and phrases were made available that he could activate in those situations. RESULTS: Data showed that both participants were successful in managing the programs arranged for them. The man with spinal cord injury activated mean frequencies of above five options per 10-min session. The post-coma man activated mean frequencies of about 12 options per 20-min session. CONCLUSIONS: Technology-aided programs for promoting leisure and communication opportunities might be successfully tailored to persons with spinal cord injury and persons with post-coma multiple disabilities. Implications for Rehabilitation Technology-aided programs may be critical to enable persons with pervasive motor impairment to engage in leisure activities and communication events independently. Persons with spinal cord injury, post-coma extended brain damage, and forms of neurodegenerative disease, such as amyotrophic lateral sclerosis, may benefit from those programs. The programs could be adapted to the participants' characteristics, both in terms of technology and contents, so as to improve their overall impact on the participants' functioning and general mood.

**Publication type:** Journal Article

**Source:** MEDLINE

25. **Title:** Functional Electrical Stimulation: Cardiorespiratory Adaptations and Applications for Training in Paraplegia.

**Citation:** Sports Medicine, 01 January 2015, vol./is. 45/1(71-82), 01121642

**Author(s):** Deley, Gaëlle, Denuziller, Jérémy, Babault, Nicolas

**Language:** English

**Abstract:** Regular exercise can be broadly beneficial to health and quality of life in humans with spinal cord injury (SCI). However, exercises must meet certain criteria, such as the intensity and muscle mass involved, to induce significant benefits. SCI patients can have difficulty achieving these exercise requirements since the paralysed muscles cannot contribute to overall oxygen consumption. One solution is functional electrical stimulation (FES) and, more importantly, hybrid training that combines volitional arm and electrically controlled contractions of the lower limb muscles. However, it might be rather complicated for therapists to use FES because of the wide variety of protocols that can be employed, such as stimulation parameters or movements induced. Moreover, although the short-term physiological and psychological responses during different types of FES exercises have been extensively reported, there are fewer data regarding the long-term effects of FES. Therefore, the purpose of this brief review is to provide a critical appraisal and synthesis of the literature on the use of FES for exercise in paraplegic individuals. After a short introduction underlying the importance of exercise for SCI patients, the main applications and effects of FES are reviewed and discussed. Major findings reveal an increased physiological demand during FES hybrid exercises as compared with arms only exercises. In addition, when repeated within a training period, FES exercises showed beneficial effects on muscle characteristics, force output, exercise capacity, bone mineral density and cardiovascular parameters. In conclusion, there appears to be promising evidence of beneficial effects of FES training, and particularly FES hybrid training, for paraplegic individuals.

**Publication type:** Journal Article

**Source:** MEDLINE

26. **Title:** Gap junction proteins and their role in spinal cord injury

**Citation:** Frontiers in Molecular Neuroscience, January 2015, vol./is. 7/JAN, 1662-5099 (06 Jan 2015)

**Author(s):** Tonkin R.S., Mao Y., O'carroll S.J., Nicholson L.F.B., Green C.R., Gorrie C.A., Moalem-Taylor G.

**Language:** English

**Abstract:** Gap junctions are specialized intercellular communication channels that are formed by two hexameric connexin hemichannels, one provided by each of the two adjacent cells. Gap junctions and hemichannels play an important role in regulating cellular metabolism, signaling, and functions in both normal and pathological conditions. Following spinal cord injury (SCI), there is damage and disturbance to the neuronal elements of the spinal cord including severing of axon tracts and rapid cell death. The initial mechanical disruption is followed by multiple secondary cascades that cause further tissue loss and dysfunction. Recent studies have implicated connexin proteins as playing a critical role in the secondary phase of
SCI by propagating death signals through extensive glial networks. In this review, we bring together past and current studies to outline the distribution, changes and roles of various connexins found in neurons and glial cells, before and in response to SCI. We discuss the contribution of pathologically activated connexin proteins, in particular connexin 43, to functional recovery and neuropathic pain, as well as providing an update on potential connexin specific pharmacological agents to treat SCI.

**Publication type:** Journal: Article  
**Source:** EMBASE

27. **Title:** Identification and treatment of sleep-disordered breathing in chronic spinal cord injury.  
**Citation:** Spinal Cord, February 2015, vol./is. 53/2(145-9), 1362-4393;1476-5624 (2015 Feb)  
**Author(s):** Sankari A, Martin JL, Bascom AT, Mitchell MN, Badr MS  
**Language:** English  
**Abstract:** STUDY DESIGN: A follow up on an ongoing prospective cohort study.OBJECTIVE: Spinal cord injury or disorder (SCI/D) patients have higher rates of sleep-disordered breathing (SDB) than the general population. The objectives of this study were to examine predictors of SDB diagnosis and to estimate rates of SDB treatment in SCI/D patients.SETTING: A SCI clinical sleep research laboratory.METHODS: Twenty-eight SCI/D patients (7 women, age 42.8+/−15.8 years; 16 cervical and 12 thoracic level injuries) completed a battery of questionnaires (Epworth Sleepiness Scale (ESS), Pittsburgh Sleep Quality Index (PSQI), Berlin questionnaire (BQ) and fatigue severity scale (FSS)) and had one night of attended laboratory polysomnography (PSG). Participants were then notified of the results of their PSG and were interviewed approximately 1 year later to assess clinical outcomes.RESULTS: The majority of patients reported poor sleep quality on all questionnaires. On the basis of PSG, 22 (79%) patients had SDB (apnea-hypopnea index (AHI)≥1 events per hour), and 17 (61%) had moderate/severe SDB (AHI≥15 events per hour). Higher ESS scores were associated with a higher risk of AHI≥5; however, other questionnaires did not distinguish between those with and without SDB using either AHI cutoff. In follow-up interviews, only 50% of patients had spoken to a health-care provider about SDB and only six patients with SDB were prescribed treatment, four of whom were using the treatment at follow-up.CONCLUSION: SDB is common and severe among SCI/D patients. Screening questionnaires do not appear to differentiate between those with and without SDB. Even when SDB was recognized, many patients remained untreated. The increased prevalence of cardiovascular disease in SCI/D patients could represent a consequence of untreated SDB, and improving diagnosis and management of SDB has the potential to improve outcomes for these patients.

**Publication type:** Journal Article  
**Source:** MEDLINE  
**Full text:** Available Nature Publishing Group at Spinal Cord

28. **Title:** Imaging techniques in spinal cord injury.  
**Citation:** World Neurosurgery, December 2014, vol./is. 82/6(1351-8), 1878-8750 (2014 Dec)  
**Author(s):** Ellingson BM, Salamon N, Holly LT  
**Language:** English  
**Abstract:** BACKGROUND: Spinal imaging plays a critical role in the diagnosis, treatment, and rehabilitation of patients with spinal cord injury (SCI). In recent years there has been increasing interest in the development of advanced imaging techniques to provide pertinent microstructural and metabolic information that is not provided by conventional modalities.METHODS: This review details the pathophysiological structural changes that accompany SCI, as well as their imaging correlates. The potential clinical applications of novel spinal cord imaging techniques to SCI are presented.RESULTS: There are a variety of novel advanced imaging techniques that are principally focused on the microstructural and/or biochemical function of the spinal cord, and can potentially be applied to traumatic SCI, including diffusion tensor imaging, magnetic resonance spectroscopy, positron emission tomography, single-photon emission computed tomography, and functional magnetic resonance imaging. These techniques are presently in various stages of development, including some whose applications are primarily limited to laboratory investigation, whereas others are being actively used in clinical practice.CONCLUSION: Advanced imaging of the spinal cord has tremendous potential to provide patient-specific physiological information about the status of cord integrity and health. Advanced spinal cord imaging is still at early stages of development and clinical implementation but is likely to play an increasingly important role in the management of spinal cord health in the foreseeable future.

**Publication type:** Journal Article  
**Source:** MEDLINE

29. **Title:** Interleukin-33 treatment reduces secondary injury and improves functional recovery after contusion spinal cord injury  
**Citation:** Brain, Behavior, and Immunity, February 2015, vol./is. 44/(68-81), 0889-1591;1090-2139 (01 Feb 2015)  
**Author(s):** Pomeshchik Y., Kidin I., Korhonen P., Savchenko E., Jaronen M., Lehtonen S., Wojciechowski S., Kanninen K., Koistinaho J., Malm T.  
**Language:** English
Abstract: Interleukin-33 (IL-33) is a member of the interleukin-1 cytokine family and highly expressed in the naive mouse brain and spinal cord. Despite the fact that IL-33 is known to be inducible by various inflammatory stimuli, its cellular localization in the central nervous system and role in pathological conditions is controversial. Administration of recombinant IL-33 has been shown to attenuate experimental autoimmune encephalomyelitis progression in one study, yet contradictory reports also exist. Here we investigated for the first time the pattern of IL-33 expression in the contused mouse spinal cord and demonstrated that after spinal cord injury (SCI) IL-33 was up-regulated and exhibited a nuclear localization predominantly in astrocytes. Importantly, we found that treatment with recombinant IL-33 alleviated secondary damage by significantly decreasing tissue loss, demyelination and astrogliosis in the contused mouse spinal cord, resulting in dramatically improved functional recovery. We identified both central and peripheral mechanisms of IL-33 action. In spinal cord, IL-33 treatment reduced the expression of pro-inflammatory tumor necrosis factor-alpha and promoted the activation of anti-inflammatory arginase-1 positive M2 microglia/macrophages, which chronically persisted in the injured spinal cord for up to at least 42 days after the treatment. In addition, IL-33 treatment showed a tendency towards reduced T-cell infiltration into the spinal cord. In the periphery, IL-33 treatment induced a shift towards the Th2 type cytokine profile and reduced the percentage and absolute number of cytotoxic, tumor necrosis factor-alpha expressing CD4+ cells in the spleen. Additionally, IL-33 treatment increased expression of T-regulatory cell marker FoxP3 and reduced expression of M1 marker iNOS in the spleen. Taken together, these results provide the first evidence that IL-33 administration is beneficial after CNS trauma. Treatment with IL33 may offer a novel therapeutic strategy for patients with acute contusion SCI.

Publication type: Journal: Article
Source: EMBASE

30. Title: International spinal cord injury: spinal interventions and surgical procedures basic data set.
Citation: Spinal Cord, February 2015, vol./is. 32/3(185-95), 1362-4393;1476-5624 (2015 Feb)
Author(s): Dvorak MF, Itshayek E, Fehlings MG, Vaccaro AR, Wing PC, Biering-Sorensen F, Noonan VK
Language: English
Abstract: STUDY DESIGN: Survey of expert opinion, feedback and final consensus.OBJECTIVE: To describe the development and the variables included in the International Spinal Cord Injury (SCI) Spinal Interventions and Surgical Procedures Basic Data set.SETTING: International working group.METHODS: A committee of experts was established to select and define data elements. The data set was then disseminated to the appropriate committees and organizations for comments. All suggested revisions were considered and both the International Spinal Cord Society and the American Spinal Injury Association endorsed the final version.RESULTS: The data set consists of nine variables: (1) Intervention/Procedure Date and start time (2) Non-surgical bed rest and external immobilization, (3) Spinal intervention-closed manipulation and/or reduction of spinal elements, (4) Surgical procedure-approach, (5) Date and time of the completion of the intervention or surgical closure; (6) Surgical procedure-open reduction, (7) Surgical procedure-direct decompression of neural elements, and (8 and 9) Surgical procedure-stabilization and fusion (spinal segment number and level). All variables are coded using numbers or characters. Each spinal intervention and procedure is coded (variables 1 through 7) and the spinal segment level is described (variables 8 and 9). Sample clinical cases were developed to illustrate how to complete it.CONCLUSION: The International SCI Spinal Interventions and Surgical Procedures Basic Data Set was developed to facilitate comparisons of spinal interventions and surgical procedures among studies, centers and countries.
Publication type: Journal Article
Source: MEDLINE
Full text: Available Nature Publishing Group at Spinal Cord

31. Title: Localized delivery of brain-derived neurotrophic factor-expressing mesenchymal stem cells enhances functional recovery following cervical spinal cord injury.
Citation: Journal of Neurotrauma, February 2015, vol./is. 32/3(185-193), 0897-7151;1557-9042 (01 Feb 2015)
Author(s): Gransee H.M., Zhan W., Sorensen F, Noonan VK
Language: English
Abstract: Neuritrophins, such as brain-derived neurotrophic factor (BDNF), are important in modulating neuroplasticity and promoting recovery after spinal cord injury. Intrathecal delivery of BDNF enhances functional recovery following unilateral spinal cord hemisection (SH) at C2, a well-established model of incomplete cervical spinal cord injury. We hypothesized that localized delivery of BDNF-expressing mesenchymal stem cells (BDNF-MSCs) would promote functional recovery of rhythmic diaphragm activity after SH. In adult rats, bilateral diaphragm electromyographic (EMG) activity was chronically monitored to determine evidence of complete SH at 3 days post-injury, and recovery of rhythmic ipsilateral diaphragm EMG activity over time post-SH. Wild-type, bone marrow-derived MSCs (WT-MSCs) or BDNF-MSCs (2x10^5 cells) were injected intraspinally at C2 at the time of injury. At 14 days post-SH, green fluorescent protein (GFP) immunoreactivity confirmed MSCs presence in the cervical spinal cord. Functional recovery in SH animals injected with WT-MSCs was not different from untreated SH controls (n=10; overall, 20% at 7 days and 30% at 14 days). In contrast, functional recovery was observed in 29% and 100% of SH animals injected with BDNF-MSCs at 7 days and 14 days post-SH, respectively (n=7). In BDNF-MSCs treated SH animals at 14 days, root-mean-squared EMG amplitude was
63+/-16% of the pre-SH value compared with 12+/-9% in the control/WT-MSCs group. We conclude that localized delivery of BDNF-expressing MSCs enhances functional recovery of diaphragm muscle activity following cervical spinal cord injury. MSCs can be used to facilitate localized delivery of trophic factors such as BDNF in order to promote neuroplasticity following spinal cord injury.

**Publication type:** Journal: Article

**Source:** MEDLINE

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**32. Title:** Management of acute spinal cord injury.

**Citation:** CONTINUUM: Lifelong Learning in Neurology, February 2015, vol./is. 21/1 Spinal Cord Disorders(159-87), 1080-2371;1538-6899 (2015 Feb)

**Author(s):** Stein DM, Sheth KN

**Language:** English

**Abstract:** PURPOSE OF REVIEW: This article provides an overview of acute spinal cord injury with an emphasis on practical issues regarding initial evaluation and management. Spinal cord injury continues to be a devastating neurologic injury and a significant public health burden, both in terms of patient morbidity as well as societal costs. Optimal management is highly dependent on a strong multidisciplinary and interprofessional collaborative approach. RECENT FINDINGS: In contrast to prior experience, current guidelines strongly suggest avoidance of steroids in patients with spinal cord injury. Additionally, early evaluation with MRI and decompressive surgery can be important for achieving good outcomes. SUMMARY: Effective management of acute spinal cord injury requires a team skilled in the approach to short- and long-term respiratory management as well as vigilance for common secondary complications including systemic thrombosis, infection, and pain syndromes.

**Publication type:** Journal Article

**Source:** EMBASE

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**33. Title:** Management of acute traumatic spinal cord injury.

**Citation:** Current Treatment Options in Neurology, February 2015, vol./is. 17/2(334), 1092-8480;1092-8480 (2015 Feb)

**Author(s):** Grant RA, Quon JL, Abbed KM

**Language:** English

**Abstract:** OPINION STATEMENT: Spinal cord injury (SCI) causes significant morbidity and mortality. Clinical management in the acute setting needs to occur in the intensive care unit in order to identify, prevent, and treat secondary insults from local ischemia, hypotension, hypoxia, and inflammation. Maintenance of adequate perfusion and oxygenation is quintessential and a mean arterial pressure >85-90 mm Hg should be kept for at least 1 week. A cervical collar and full spinal precautions (log-roll, flat, holding C-spine) should be maintained until the spinal column has been fully evaluated by a spine surgeon. In patients with SCI, there is a high incidence of other bodily injuries, and there should be a low threshold to assess for visceral, pelvic, and long bone injuries. Computed tomography of the spine is superior to plain films, as the former rarely misses fractures, though caution needs to be exerted as occipitocervical dislocation can still be missed. To reliably assess the spinal neural elements, soft tissues, and ligamentous structures, magnetic resonance imaging is indicated and should be obtained within 48-72 h from the time of injury. All patients should be graded daily using the American Spinal Injury Association classification, with the first prognostic score at 72 h postinjury. Patients with high cervical cord (C4 or higher) injury should be intubated immediately, and those with lower cord injuries should be evaluated on a case-by-case basis. However, in the acute setting, respiratory mechanics will be disrupted with any spinal cord lesion above T11. Steroids have become extremely controversial, and the professional societies for neurosurgery in the United States have given a level 1 statement against their use in all patients. We, therefore, do not advocate for them at this time. With every SCI, a spine surgeon must be consulted to discuss operative vs nonoperative management strategies. Indications for surgery include a partial or progressive neurologic deficit, instability of the spine not allowing for mobilization, correction of a deformity, and prevention of potential neurologic compromise. Measures to prevent pulmonary emboli from deep venous thromboembolisms are necessary: IVC filters are recommended in bedbound patients and low-molecular weight heparins are superior to unfractionated heparin. Robust prevention of pressure ulcers as well as nutritional support should be a mainstay of treatment. Lastly, it is important to note that neurologic recovery is a several-year process. The most recovery occurs in the first year following injury, and therefore aggressive rehabilitation is crucial.

**Publication type:** Journal Article

**Source:** MEDLINE

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**34. Title:** Modulation of hand aperture during reaching in persons with incomplete cervical spinal cord injury.

**Citation:** Experimental Brain Research, March 2015, vol./is. 233(3)(871-84), 0014-4819;1432-1106 (2015 Mar)

**Author(s):** Stahl VA, Hayes HB, Buetefisch CM, Wolf SL, Trumbower RD

**Language:** English

**Abstract:** The intact neuromotor system prepares for object grasp by first opening the hand to an aperture that is scaled according to object size and then closing the hand around the object. After cervical spinal cord injury (SCI), hand function...
Conclusions Strong levels of evidence were found for 4 of the 8 interventions: functional electrical stimulation in spinal
analysis) was deemed inappropriate. Instead, descriptive comparisons wer
compression, physical countermaneuvers, compression
orthostatic hypotension under 2 general categories: physical modalities (exercise, functional electrical stimulation,
nonrandomized trials. Data Synthesis There were 8 identified nonpharmacologic interventions for management of
orthostatic hypotension under 2 general categories: physical modalities (exercise, functional electrical stimulation,
compression, physical countermaneuvers, compression with physical countermaneuvers, sleeping with head up) and
dietary measures (water intake, meals). Owing to the clinically diverse nature of the studies, statistical comparison (meta-
analysis) was deemed inappropriate. Instead, descriptive comparisons were drawn. Levels of evidence were assigned.
Conclusions Strong levels of evidence were found for 4 of the 8 interventions: functional electrical stimulation in spinal

35. Title: Neurophysiological correlates of sleep leg movements in acute spinal cord injury
Citation: Clinical Neurophysiology, February 2015, vol./is. 126/2(333-338), 1388-2457;1872-8952 (01 Feb 2015)
Author(s): Ferri R., Proserpio P., Rundo F., Lanza A., Sambusida K., Redaelli T., De Carli F., Nobili L.
Language: English
Abstract: Objective: The objective of this study was to analyze the periodicity of leg movement activity emerging during
sleep in a group of patients with spinal cord injury and to evaluate their pathophysiological features. Methods: Twenty
patients (16 males, mean age 34.0. years) with traumatic spinal cord lesions were recruited (5 cervical, 15 thoracic; 16
level A and 4 level B at the American Spinal Injury Association impairment scale). Periodicity of sleep leg movements was
analyzed; electroencephalographic spectral analysis and heart rate were evaluated for 20. s preceding and 30. s following
the onset of leg movements. Results: Periodic leg movements during sleep (PLMS) index >5/h was found in only 4 patients
and only 2 of these had PLMS index >15/h. Eleven patients (group I) did not show any increase in heart rate related to the
occurrence of leg movements while the remaining 9 did (group II). Two patients in each group had American Spinal Injury
Association impairment level B; 5 patients of group I and none of group II had cervical lesions while 6 patients of group I
and all 9 of group II had thoracic lesions. Only 2 patients in group I presented clearly periodic leg movements during sleep
and PLMS index >15/h. Electroencephalographic delta, alpha and beta bands around leg movements increased clearly in
group II while the changes in group I were very limited or absent. Conclusion: Leg movements during sleep are recorded in
spinal cord injury patients with completely absent volitional activity in their lower limb but they show clear periodicity
only in a small subgroup of them. Significance: The disconnection from higher nervous structures, in patients with spinal
cord injury might favor the appearance of leg movements due to the activity of spinal generators not inhibited by higher
influences; correlated autonomic and electroencephalographic changes can be absent. This motor activity might assume
the periodic character when a genetic predisposition is present.
Publication type: Journal: Article
Source: EMBASE

36. Title: Nonpharmacologic management of orthostatic hypotension: A systematic review
Citation: Archives of Physical Medicine and Rehabilitation, February 2015, vol./is. 96/2(366-375.e6), 0003-9993;1532-821X
(01 Feb 2015)
Author(s): Mills P.B., Fung C.K., Travlos A., Krassioukov A.
Language: English
Abstract: Objective To systematically review the literature on nonpharmacologic treatment of orthostatic hypotension.
Data Sources MEDLINE, Cumulative Index to Nursing and Allied Health Literature, Embase, Cochrane Central Register of
Controlled Trials, and SPORTDiscus were searched for human studies written in the English language between January
1980 and April 2013. Reference lists of relevant articles were reviewed for citations to expand the data set. Study
Selection Prospective experimental studies assessing nonpharmacologic interventions for management of orthostatic drop
in blood pressure in various patient populations were included. All studies identified through the literature search were
reviewed independently in duplicate. Of the 642 studies, 23 met the selection criteria. Data Extraction Two reviewers
independently extracted data for analysis, including systolic and diastolic blood pressure and orthostatic symptoms in
response to postural challenge before and after the intervention. All 23 studies were assessed in duplicate for risk of bias
using the Physiotherapy Evidence Database scale for randomized controlled trials and the Downs and Black tool for
nonrandomized trials. Data Synthesis There were 8 identified nonpharmacologic interventions for management of
orthostatic hypotension under 2 general categories: physical modalities (exercise, functional electrical stimulation,
compression, physical countermaneuvers, compression with physical countermaneuvers, sleeping with head up) and
dietary measures (water intake, meals). Owing to the clinically diverse nature of the studies, statistical comparison (meta-
analysis) was deemed inappropriate. Instead, descriptive comparisons were drawn. Levels of evidence were assigned.
Conclusions Strong levels of evidence were found for 4 of the 8 interventions: functional electrical stimulation in spinal
cord injury, compression of the legs and/or abdomen, physical countermaneuvers in various patient populations, and eating smaller and more frequent meals in chronic autonomic failure. However, this conclusion is based on a limited number of studies with small sample sizes. Further research into all interventions is warranted.

**Publication type:** Journal: Review  
**Source:** EMBASE  
**Full text:** Available [ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION](https://www.archives-pmr.org) at Archives of Physical Medicine and Rehabilitation  
**Full text:** Available [ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION](https://www.archives-pmr.org) at Salisbury District Hospital Healthcare Library

37. **Title:** Oxidative stress and antioxidative parameters in patients with spinal cord injury: Implications in the pathogenesis of disease  
**Citation:** Spinal Cord, January 2015, vol./is. 53/1(3-6), 1362-4393;1476-5624 (10 Jan 2015)  
**Author(s):** Fatima G., Sharma V.P., Das S.K., Mahdi A.A.  
**Language:** English  
**Abstract:** Study design: Oxygen-derived free radicals have been implicated in the pathogenesis of spinal cord injury (SCI) after trauma. Objective: In this review we will elucidate the importance of oxidative stress and antioxidants and its possible relationship with SCI. Methods: Literature analysis of oxidative stress, antioxidative parameters based on its implications in the pathogenesis along with devastating effect of oxidative stress parameters on SCI patients and its suggested proposed treatment by antioxidants have been performed. Results: SCI remains a major health problem despite advances in neurotechnology. Previous studies have reported oxidative stress in SCI patients, but the results were inconsistent. Furthermore, increased free radical levels are reported in SCI. Moreover, we have also mentioned in this review that oxidative stress is supposed to be increased in patients with SCI, which is related to the severity of SCI pain. Conclusion: Oxidative stress was commonly seen in SCI patients, which may provide useful information to augment the understanding of pathophysiology of SCI patients. However, complete understanding of the biochemical events occurring at a cellular level that influence oxidative damage is required to guide future therapeutic advances. Furthermore, supplementation of antioxidants may also be considered in these patients.  
**Publication type:** Journal: Review  
**Source:** EMBASE  
**Full text:** Available [Nature Publishing Group](https://www.nature.com) at Spinal Cord

38. **Title:** Pharmacokinetics of the ghrelin agonist capromorelin in a single ascending dose Phase-I safety trial in spinal cord-injured and able-bodied volunteers.  
**Citation:** Spinal Cord, February 2015, vol./is. 53/2(103-8), 1362-4393;1476-5624 (2015 Feb)  
**Author(s):** Ellis AG, Zeqlinski PT, Brown DJ, Frauman AG, Millard M, Furness JB  
**Language:** English  
**Abstract:** STUDY DESIGN: Single centre, single ascending dose study.OBJECTIVES: To compare the pharmacokinetics and assess the safety of capromorelin, a compound that has potential to treat constipation following spinal cord injury (SCI), in groups of able-bodied and SCI volunteers.SETTING: Local population from Victoria, Australia.METHODS: Following initial screening and baseline blood collections, participants received ascending oral doses (20, 50 and then 100mg at least 1-week apart) of capromorelin after pre-dose blood collection, followed by blood collections over the following 12h for pharmacokinetic analysis and 1-week and 4-week follow-up blood collections for safety evaluations. Blood pressure and heart rate were monitored.RESULTS: No serious adverse events were recorded following any dose in either the able-bodied group or the SCI group. There were no abnormal blood pressure or heart rate changes. Minor adverse events resolved quickly without the need for treatment. Pharmacokinetic behaviour was broadly similar between groups, with both exhibiting dose-dependent increases in Cmax and AUC0-\(\infty\). The SCI participants showed greater variance in pharmacokinetic parameters and had a slightly delayed Tmax and half-life.CONCLUSION: Capromorelin at the doses tested was safe and well tolerated in both SCI and able-bodied participants and also showed similar pharmacokinetics with dose-dependent increases in concentration and drug exposure.SPONSORSHIP: Support for the study was provided by the Victorian State Government Transport Accident Commission.  
**Publication type:** Journal Article  
**Source:** MEDLINE  
**Full text:** Available [Nature Publishing Group](https://www.nature.com) at Spinal Cord

**Citation:** Spinal Cord, February 2015, vol./is. 53/2(125-9), 1362-4393;1476-5624 (2015 Feb)  
**Author(s):** de Heredia LL, Belci M, Briley D, Hughes RJ, McNeillis B, Meagher TM, Yanny S, McKeans D  
**Language:** English  
**Abstract:** STUDY DESIGN: Prospective study.OBJECTIVE: To ascertain the prevalence of posterior circulation stroke in
traumatic chronic spinal cord injured (SCI) patients and associated traumatic vertebral artery injuries (VAI). METHODS: All adult patients with cervical SCI and American Spinal Injury Association Impairment Scale (AIS) grade A or B referred for follow-up magnetic resonance imaging of their spinal cord were invited to take part in the study between January 2010 and December 2012 at the National Spinal Injury Centre. Two additional sequences were added to the existing imaging protocol to evaluate the brain and vertebral arteries. RESULTS: Ninety-eight patients were recruited. All imaging were analysed independently by three consultant radiologists. Posterior circulation infarcts were noted in seven (7%) patients. Significant VAI was noted in 13 patients (13%) with 10 occlusions and 3 with high-grade stenosis. However, only one patient had co-existent posterior circulation infarct and significant VAI. CONCLUSION: There is an increased prevalence of posterior circulation infarction in SCI patients. The relationship with associated traumatic VAI requires further investigation.

**Abstract:**

INTRODUCTION: The World Health Organization recognizes sexual health as a fundamental right that should be guaranteed to all individuals. Sexual dysfunction affects various aspects in the lives (physical, psychic, and social) of affected persons. AIMS: To assess the different types of sexual dysfunction, the quality of life (QOL), depression, anxiety, and levels of self-esteem observed in 165 men with sexual dysfunction, both with and without spinal cord injury (SCI). METHODS: Case control study of 85 men with SCI and sexual dysfunction, and 80 men without SCI that have sexual dysfunction. MAIN OUTCOMES MEASURES: The Sexual Health Evaluation Scale, the Fugl-Meyer Life Satisfaction Questionnaire scale, the Hospital Anxiety and Depression Scale, the Evaluation of the Sexual Health Scale, and Rosenberg's

**Publication type:** Journal Article

**Source:** MEDLINE

**Full text:** Available Nature Publishing Group at Spinal Cord


**Citation:** Archives of Physical Medicine & Rehabilitation, 01 January 2015, vol./is. 96/1(133-140), 00039993

**Author(s):** Williams, Ryan, Murray, Adrian

**Language:** English

**Abstract:** Objectives To use meta-analysis to synthesize point prevalence estimates of depressive disorder diagnoses for persons who have sustained a spinal cord injury (SCI). Data Sources We searched PsycINFO, PubMed, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Dissertation Abstracts International (DAI) for studies examining depression after SCI through 2013. We also conducted a manual search of the reference sections of included studies. Study Selection Included studies contained persons with SCI; used a diagnostic measure of depression (ie, an unstructured, semi-structured, or structured clinical interview, and/or a clinician diagnosis); and provided a diagnosis of major or minor depressive episodes for the subjects in the study. Diagnostic criteria were based on the Diagnostic and Statistical Manual of Mental Disorders , Fourth Edition, or the Diagnostic and Statistical Manual of Mental Disorders-Third Edition (including Research Diagnostic Criteria) criteria. Data Extraction The 2 authors of this study screened the titles and abstracts of 1053 unique studies for inclusion in this meta-analysis. Nineteen studies, containing 35,676 subjects and 21 effect size estimates, were included. Data Synthesis The mean prevalence estimate of depression diagnosis after SCI was 22.2%, with a lower-bound estimate of 18.7% and an upper bound estimate of 26.3%. Random effects and mixed effects models were used in this work. A small number of study moderators were explored, including sample sex composition, Diagnostic and Statistical Manual of Mental Disorders version used, data collection method (primary vs secondary), sample traumatic etiology composition, sample injury level and completeness composition, and sample diagnostic composition. Data collection method, Diagnostic and Statistical Manual of Mental Disorders version, and diagnostic composition significantly predicted variation in observed effect size estimates, with primary data collection studies having lower estimates compared with secondary data analysis studies, studies using Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, diagnostic criteria having higher estimates compared with studies using Diagnostic and Statistical Manual of Mental Disorders, Third Edition, criteria, and samples comprising individuals diagnosed only with major depression having lower prevalence estimates. Conclusions The existing data on depression after SCI indicate that the prevalence of depression after SCI is substantially greater than that in the general medical population. These results underscore the importance of continued research on measuring depression in persons with SCI and on treatments for depression after SCI.

**Publication type:** Journal Article

**Source:** CINAHL

**Full text:** Available ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION at Archives of Physical Medicine and Rehabilitation

**Full text:** Available ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION at Salisbury District Hospital Healthcare Library

41. **Title:** Psychological Impact and Sexual Dysfunction in Men with and without Spinal Cord Injury.

**Citation:** Journal of Sexual Medicine, February 2015, vol./is. 12/2(436-44), 1743-6095;1743-6109 (2015 Feb)

**Author(s):** Cobo Cuenca AI, Sampietro-Crespo A, Virseda-Chamorro M, Martin-Espinosa N

**Language:** English

**Abstract:** INTRODUCTION: The World Health Organization recognizes sexual health as a fundamental right that should be guaranteed to all individuals. Sexual dysfunction affects various aspects in the lives (physical, psychic, and social) of affected persons. AIMS: To assess the different types of sexual dysfunction, the quality of life (QOL), depression, anxiety, and levels of self-esteem observed in 165 men with sexual dysfunction, both with and without spinal cord injury (SCI). METHODS: Case control study of 85 men with SCI and sexual dysfunction, and 80 men without SCI that have sexual dysfunction. MAIN OUTCOMES MEASURES: The Sexual Health Evaluation Scale, the Fugl-Meyer Life Satisfaction Questionnaire scale, the Hospital Anxiety and Depression Scale, the Evaluation of the Sexual Health Scale, and Rosenberg's
Self-esteem Scale were all used for data collection. RESULTS: Of the members in group A (with SCI), 89.4% (76) showed erectile dysfunction, and 75.2% (64) reported anejaculation. In group B (without SCI), 75 (96.8%) showed erectile dysfunction, and 58.7% (47) had disorders of sexual desire. In group A, 16.47% (14) showed signs of depression, and 35.3% (30) had signs of anxiety. In group B, 30% (24) had elevated scores regarding depression, and 48.75% (39) had high scores for anxiety. All of the participants reported a high general QOL and a high satisfaction with their QOL but reported that their satisfaction with their sexual lives was only at the acceptable level. Social QOL is significantly higher in the SCI group (t Student P=0.031). The QOL, self-esteem, and anxiety and depression levels are significantly correlated. CONCLUSIONS: Men with sexual dysfunction strive to adapt to their situations, with the relationship between the type of sexual dysfunction and the QOL, mood (depression), and self-esteem all being important considerations.


**Publication type:** Journal Article
**Source:** MEDLINE

42. **Title:** Recovery of sensorimotor function and activities of daily living after cervical spinal cord injury: The influence of age

**Citation:** Journal of Neurotrauma, February 2015, vol./is. 32/3(194-199), 0897-7151;1557-9042 (01 Feb 2015)

**Author(s):** Wirz M., Dietz V.

**Language:** English

**Abstract:** This retrospective study was designed to examine the influence of age on the outcome of motor function and activities of daily living (ADLs) in patients with a cervical spinal cord injury (SCI). The study is based on the data registry of the European Multicenter Study of Spinal Cord Injury (EMSCI) study group. Initial upper-extremity motor score (UEMS) and its change over 5 months, as well as the initial Spinal Cord Independence Measure (SCIM) score, did not differ between younger adults (20-39 years) and elderly (60-79 years) patients. However, the change in SCIM score over 5 months was significantly greater in the younger patient group. Initial UEMS, SCIM, and ulnar compound motor action potentials (CMAP), reflecting peripheral nerve damage (motoneurons and roots), were significantly greater in incomplete, compared to complete, SCI, regardless of age group. The initial assessment of UEMS in combination with CMAP recordings allows an early prediction of ADLs outcomes in both younger adults and elderly subjects. The impaired translation of gain in motor score into increased ADL independence in elderly patients requires specifically tailored rehabilitation programs.

**Publication type:** Journal: Article
**Source:** EMBASE

43. **Title:** Rehabilitation of spinal cord injuries.

**Citation:** World Journal of Orthopedics, January 2015, vol./is. 6/1(8-16), 2218-5836;2218-5836 (2015 Jan 18)

**Author(s):** Nas K, Yazmalar L, Sah V, Aydin A, Ones K

**Language:** English

**Abstract:** Spinal cord injury (SCI) is the injury of the spinal cord from the foramen magnum to the cauda equina which occurs as a result of compulsion, incision or contusion. The most common causes of SCI in the world are traffic accidents, gunshot injuries, knife injuries, falls and sports injuries. There is a strong relationship between functional status and whether the injury is complete or not complete, as well as the level of the injury. The results of SCI bring not only damage to independence and physical function, but also include many complications from the injury. Neurogenic bladder and bowel, urinary tract infections, pressure ulcers, orthostatic hypotension, fractures, deep vein thrombosis, spasticity, autonomic dysreflexia, pulmonary and cardiovascular problems, and depressive disorders are frequent complications after SCI. SCI leads to serious disability in the patient resulting in the loss of work, which brings psychosocial and economic problems. The treatment and rehabilitation period is long, expensive and exhausting in SCI. Whether complete or incomplete, SCI rehabilitation is a long process that requires patience and motivation of the patient and relatives. Early rehabilitation is important to prevent joint contractures and the loss of muscle strength, conservation of bone density, and to ensure normal functioning of the respiratory and digestive system. An interdisciplinary approach is essential in rehabilitation in SCI, as in the other types of rehabilitation. The team is led by a physiatrist and consists of the patients' family, physiotherapist, occupational therapist, dietician, psychologist, speech therapist, social worker and other consultant specialists as necessary.

**Publication type:** Journal Article, Review
**Source:** MEDLINE

44. **Title:** Relationship quality and perceived social support in persons with spinal cord injury.

**Citation:** Spinal Cord, February 2015, vol./is. 53/2(120-4), 1362-4393;1476-5624 (2015 Feb)

**Author(s):** Tramonti F, Gerini A, Stampacchia G

**Language:** English

**Abstract:** STUDY DESIGN: This is a cross-sectional study. OBJECTIVES: The objective of this study was to examine the...
associations among the quality of couple relationship, perceived social support and health-related quality of life (HRQoL) in persons with spinal cord injury (SCI). SETTING: The study was conducted in Italy. METHODS: Forty-three persons with SCI were administered questionnaires for the evaluation of relationship quality (Dyadic Adjustment Scale), perceived social support (Multidimensional Scale of Perceived Social Support) and HRQoL (Short Form 36). RESULTS: Many significant correlations between the scores of relationship quality and social support were detected. Relationship quality also correlated with relevant measures of HRQoL, such as Mental Health and Vitality. No correlation between spousal support and HRQoL was found, whereas friends’ support correlated with Physical Role Functioning. CONCLUSIONS: Data suggest that the perception of social support is strictly related to relationship quality and that marital satisfaction might be related to relevant aspects of HRQoL more likely than social support itself.

**Publication type:** Journal Article  
**Source:** MEDLINE  
**Full text:** Available Nature Publishing Group at Spinal Cord

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**45. Title:** Research advances in the application of methylprednisolone in the treatment of acute spinal cord injury.  
**Citation:** Chung-Kuo I Hsueh Ko Hsueh Yuan Hsueh Pao Acta Academiae Medicinae Sinicae, December 2014, vol./is. 36/6(680-5), 1000-503X;1000-503X (2014 Dec)  
**Author(s):** Kong XY, Gao J, Yang Y, Li YN, Ma WB, Xing B, Wang RZ  
**Language:** English  
**Abstract:** Acute spinal cord injury (ASCI), mainly caused by traffic accidents and fall injuries, is a catastrophic event that can profoundly affect the trajectory of a patient’s life. Debate continues over the medical management of ASCI, in particular the usefulness, dosage, and potential risks of methylprednisolone (MP). Although the results of American National Acute Spinal Cord Injury Study 2 and 3 trials led to the wide adoption of a high-dose MP regimen for ASCI patients, the reliabilities of their study methods and data were still questionable. Based on the currently available literature, we conclude that high-dose MP is no longer a recommended therapy for ASCI; however, due to the lack of effective treatment, it remains a useful option for this condition.

**Publication type:** Journal Article  
**Source:** MEDLINE

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**46. Title:** Risk factors for respiratory failure with tetraplegia after acute traumatic cervical spinal cord injury.  
**Citation:** European Review for Medical & Pharmacological Sciences, January 2015, vol./is. 19/1(9-14), 1128-3602;2284-0729 (2015 Jan)  
**Author(s):** Song J, Shao J, Qi HH, Song DW, Zhu W  
**Language:** English  
**Abstract:** OBJECTIVE: To analyze risk factors for respiratory failure with tetraplegia after acute traumatic cervical spinal cord injury (CSCI). PATIENTS AND METHODS: Total 180 tetraplegia cases after acute traumatic CSCI treated in Shanghai Changzheng Hospital from 2001 to 2011 were reviewed retrospectively and the frequency of respiratory failure in these patients were analyzed against the factors including age, gender, cause of injury, level/severity of injury, high-dose methylprednisolone (MP) therapy, and surgery intervention, using Chi-square test to look into the correlations of the prevalence of respiratory failure to those factors. RESULTS: Of the 180 tetraplegia with acute traumatic CSCI, 29 patients (16.11%) developed respiratory failure. The factors, including age, level and severity of injury, high-dose MP therapy, and surgery intervention, were found to significantly correlate with the appearance of respiratory failure in tetraplegia after acute traumatic CSCI (p < 0.05), while no significant correlation was found between the other factors: gender and cause of injury and the frequency of respiratory failure. CONCLUSIONS: Age, level/severity of injury, high-dose MP therapy, and surgery intervention are the four major relevant factors of respiratory failure in patients with acute traumatic CSCI. The appropriate and timing treatments involving high-dose MP therapy and surgical decompression and reconstruction can substantially increase the rates of clinical improvements and reduce the frequency of respiratory failure.

**Publication type:** Journal Article  
**Source:** MEDLINE

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**47. Title:** Serotonergic transmission after spinal cord injury.  
**Citation:** Journal of Neural Transmission, February 2015, vol./is. 122/2(279-95), 0300-9564;1435-1463 (2015 Feb)  
**Author(s):** Nardone R, Holler Y, Thomschewski A, Holler P, Lochner P, Golaszewski S, Brigo F, Trinka E  
**Language:** English  
**Abstract:** Changes in descending serotonergic innervation of spinal neural activity have been implicated in symptoms of paralysis, spasticity, sensory disturbances and pain following spinal cord injury (SCI). Serotonergic neurons possess an enhanced ability to regenerate or sprout after many types of injury, including SCI. Current research suggests that serotonin (5-HT) release within the ventral horn of the spinal cord plays a critical role in motor function, and activation of 5-HT receptors mediates locomotor control. 5-HT originating from the brain stem inhibits sensory afferent transmission and associated spinal reflexes; by abolishing 5-HT innervation SCI leads to a disinhibition of sensory transmission. 5-HT denervation supersensitivity is one of the key mechanisms underlying the increased motoneuron excitability that occurs
after SCI, and this hyperexcitability has been demonstrated to underlie the pathogenesis of spasticity after SCI. Moreover, emerging evidence implicates serotoninergic descending facilitatory pathways from the brainstem to the spinal cord in the maintenance of pathologic pain. There are functional relevant connections between the descending serotoninergic system from the rostral ventromedial medulla in the brainstem, the 5-HT receptors in the spinal dorsal horn, and the descending pain facilitation after tissue and nerve injury. This narrative review focussed on the most important studies that have investigated the above-mentioned effects of impaired 5-HT-transmission in humans after SCI. We also briefly discussed the promising therapeutical approaches with serotoninergic drugs, monoclonal antibodies and intraspinal cell transplantation.

**Publication type:** Journal Article  
**Source:** MEDLINE

**48.**Title: Short-term Cortical Plasticity Associated With Feedback-Error Learning After Locomotor Training in a Patient With Incomplete Spinal Cord Injury.  
**Citation:** Physical Therapy, February 2015, vol./is. 95/2(257-66), 0031-9023;1538-6724 (2015 Feb)  
**Author(s):** Chisholm AE, Peters S, Borich MR, Boyd LA, Lam T  
**Language:** English  
**Abstract:** BACKGROUND AND PURPOSE: For rehabilitation strategies to be effective, training should be based on principles of motor learning, such as feedback-error learning, that facilitate adaptive processes in the nervous system by inducing errors and recalibration of sensory and motor systems. This case report suggests that locomotor resistance training can enhance somatosensory and corticospinal excitability and modulate resting-state brain functional connectivity in a patient with motor-incomplete spinal cord injury (SCI). CASE DESCRIPTION: The short-term cortical plasticity of a 31-year-old man who had sustained an incomplete SCI 9.5 years previously was explored in response to body-weight-supported treadmill training with velocity-dependent resistance applied with a robotic gait orthosis. The following neurophysiological and neuroimaging measures were recorded before and after training. Sensory evoked potentials were elicited by electrical stimulation of the tibial nerve and recorded from the somatosensory cortex. Motor evoked potentials were generated with transcranial magnetic stimulation applied over the tibialis anterior muscle representation in the primary motor cortex. Resting-state functional magnetic resonance imaging was performed to evaluate short-term changes in patterns of brain activity associated with locomotor training. OUTCOMES: Somatosensory excitability and corticospinal excitability were observed to increase after locomotor resistance training. Motor evoked potentials increased (particularly at higher stimulation intensities), and seed-based resting-state functional magnetic resonance imaging analyses revealed increased functional connectivity strength in the motor cortex associated with the less affected side after training. DISCUSSION: The observations suggest evidence of short-term cortical plasticity in 3 complementary neurophysiological measures after one session of locomotor resistance training. Future investigation in a sample of people with incomplete SCI will enhance the understanding of potential neural mechanisms underlying the behavioral response to locomotor resistance training. Copyright 2015 American Physical Therapy Association.  
**Publication type:** Journal Article  
**Source:** MEDLINE  
**Full text:** Available Highwire Press at Physical Therapy

**49.**Title: Sleep apnea and periodic leg movements in the first year after spinal cord injury  
**Citation:** Sleep Medicine, January 2015, vol./is. 16/1(59-66), 1389-9457;1878-5506 (01 Jan 2015)  
**Author(s):** Proserpio P., Lanza A., Sambusida K., Fratticci L., Frigerio P., Sommariva M., Stagni E.G., Redaelli T., De Carli F., Nobili L.  
**Language:** English  
**Abstract:** Background: Sleep disturbances are frequently reported by patients with spinal cord injury (SCI). Studies have shown an increased incidence of sleep-disordered breathing (SDB) and periodic leg movements during sleep (PLMS) in people with stable long-term SCI. Methods: This was a prospective observational study in order to evaluate the features and possible predisposing factors of SDB and PLMS in a heterogenic population of consecutive SCI patients admitted at the Spinal Unit of the Niguarda Hospital within the first year after injury. Each patient underwent a clinical assessment, full polysomnography, and arterial blood gas analysis before and immediately after sleep. Multiple logistic regressions were applied in order to evaluate factors associated with SDB and PLMS. Results: Thirty-five (15 tetraplegic and 20 paraplegic) patients were enrolled. Nine patients (25.7%) had an obstructive SDB and 10 (28.6%) had PLMS. The frequency of SDB was higher in tetraplegic with respect to paraplegic patients (Wald statistic: 7.71; P=0.0055), whereas PLMS were significantly more frequent in patients with an incomplete motor lesion than in subjects with a complete motor lesion (Wald statistic: 6.14; P=0.013). Conclusion: This study confirms a high frequency of SDB and PLMS in SCI patients in the first year following injury. Independently from possible sub-acute and chronic clinical variables, the level and the completeness of the spinal cord lesion are the main factors associated respectively with an early development of SDB and PLMS.  
**Publication type:** Journal: Article  
**Source:** EMBASE
50. Title: Social and community participation following spinal cord injury: a critical review.  
Citation: International Journal of Rehabilitation Research, March 2015, vol./is. 38/1(1-19), 0342-5282;1473-5660 (2015 Mar)  
Author(s): Barclay L, McDonald R, Lentin P  
Language: English  
Abstract: Evaluation of rehabilitation outcomes following acquired disability should include participation in social and community life. Evidence is needed to guide clinical practice to ensure that it is client-centered; therefore, findings from studies that report on social and community participation following spinal cord injury (SCI) need to be reviewed and synthesized. The objectives of this critical literature review are to examine the available evidence on social and community participation following SCI and to examine the factors that influence that participation. The barriers and facilitators will be identified and described in terms of the contextual factors - personal or environmental, as outlined by the International Classification of Functioning, Disability and Health. An additional objective is to appraise the quality of the evidence examined. A systematic literature search was completed in the databases OVID MEDLINE, AMED, CINAHL PLUS, PSYCHINFO, and hand searches were carried out. Quantitative, qualitative, and mixed methods studies were included. Twenty-three studies fulfilled the inclusion criteria: 17 quantitative, five qualitative, and one mixed methods. In general, studies were of low methodological quality, and no intervention studies were identified. The terms participation, social participation, and community participation were used interchangeably often without clarification of meaning. Adequate personal care assistance, appropriate social support, having adequate specialized equipment, and appropriate occupational therapy input were found to facilitate social and community participation, whereas problems with transport, inaccessibility of the natural and built environment, issues with healthcare services and rehabilitation providers, and pain were identified as barriers. In-depth investigation into what aspects of social and community participation are important to those living with SCI is needed so that client-focused solutions and interventions can be identified and developed, aimed at creating and promoting opportunities for social and community participation.  
Publication type: Journal Article  
Source: MEDLINE

51. Title: The artificial somato-autonomic reflex arch does not improve lower urinary tract function in patients with spinal cord lesions  
Citation: Journal of Urology, February 2015, vol./is. 193/2(598-604), 0022-5347;1527-3792 (01 Feb 2015)  
Author(s): Rasmussen M.M., Rawashdeh Y.F., Clemmensen D., Tankisi H., Fuglsang-Frederiksen A., Krogh K., Christensen P.  
Language: English  
Abstract: Purpose The artificial somato-autonomic reflex arch (Xiao procedure) was proposed as treatment for neurogenic bladder dysfunction. We investigated the effects of the procedure on lower urinary tract function. Materials and Methods Seven and 3 patients with a median age of 46 years (range 19 to 64) had A15 A and B spinal cord injury, respectively. In these patients an anastomosis was created between the ventral (motor) part of L5 and the ventral part of the S2 root. Urodynamics were performed and a standard questionnaire was completed at baseline and 18 months postoperatively. Results Artificial reflex arch stimulation did not initiate voiding or increase bladder pressure. Maximum bladder capacity did not change significantly from baseline to followup (median 427.5 ml, range 168 to 581 vs 498.5, range 271 to 580, p = 0.09). Likewise, bladder compliance did not significantly differ at baseline and followup (median 16.9 ml/cm H<sub>&lt;</sub>2</sub>&gt;0, range 15.0 to 65.0 vs 25.1, range 17.5 to 50.0, p = 0.95). No difference was found in awareness of bladder emptying, incontinence episodes, bladder emptying method or medication use for neurogenic bladder dysfunction. The only statistically significant change was a decreased incidence of leakage at followup on urodynamics (p = 0.03). Postoperatively decreased genital sensation and erectile dysfunction developed in 1 patient and another experienced a minor cerebrovascular accident with no long-term complications. Conclusions In contrast to earlier findings, creation of an artificial somato-autonomic reflex arch in patients with spinal cord injury had no clinically relevant effect on lower urinary tract function.  
Publication type: Journal: Article  
Source: EMBASE  
Full text: Available Elsevier at Salisbury District Hospital Healthcare Library  
Full text: Available Elsevier at Journal of Urology, The

52. Title: The effects of transcranial direct current stimulation in patients with neuropathic pain from spinal cord injury  
Citation: Clinical Neurophysiology, February 2015, vol./is. 126/2(382-390), 1388-2457;1872-8952 (01 Feb 2015)  
Language: English  
Abstract: Objective: Transcranial direct current stimulation (tDCS) has demonstrated efficacy for reducing neuropathic pain, but the respective mechanisms remain largely unknown. The current study tested the hypothesis that pain reduction with tDCS is associated with an increase in the peak frequency spectrum density in the theta-alpha range. Methods:
Twenty patients with spinal cord injury and bilateral neuropathic pain received single sessions of both sham and anodal tDCS (2 mA) over the left primary motor area (M1) for 20 min. Treatment order was randomly assigned. Pre- to post-procedure changes in pain intensity and peak frequency of electroencephalogram spectral analysis were compared between treatment conditions. Results: The active treatment condition (anodal tDCS over M1) but not sham treatment resulted in significant decreases in pain intensity. In addition, consistent with the study hypothesis, peak theta-alpha frequency (PTAF) assessed from an electrode placed over the site of stimulation increased more from pre- to post-session among participants in the active tDCS condition, relative to those in the sham tDCS condition. Moreover, we found a significant association between a decrease in pain intensity and an increase in PTAF at the stimulation site. Conclusions: The findings are consistent with the possibility that anodal tDCS over the left M1 may be effective, at least in part, because it results in an increase in M1 cortical excitability, perhaps due to a pain inhibitory effect of motor cortex stimulation that may influence the descending pain modulation system. Future research is needed to determine if there is a causal association between increased left anterior activity and pain reduction. Significance: The results provide new findings regarding the effects of tDCS on neuropathic pain and brain oscillation changes.

Publication type: Journal: Article
Source: EMBASE

53.Title: The role of the JAK-STAT pathway in neural stem cells, neural progenitor cells and reactive astrocytes after spinal cord injury (Review)
Citation: Biomedical Reports, 2015, vol./is. 3/2(141-146), 2049-9434;2049-9442 (2015)
Language: English
Abstract: Patients with spinal cord injuries can develop severe neurological damage and dysfunction, which is not only induced by primary but also by secondary injuries. As an evolutionarily conserved pathway of eukaryotes, the JAK-STAT pathway is associated with cell growth, survival, development and differentiation; activation of the JAK-STAT pathway has been previously reported in central nervous system injury. The JAK-STAT pathway is directly associated with neurogenesis and glia scar formation in the injury region. Following injury of the axon, the overexpression and activation of STAT3 is exhibited specifically in protecting neurons. To investigate the role of the JAK-STAT pathway in neuroprotection, we summarized the effect of JAK-STAT pathway in the following three sections: Firstly, the modulation of JAK-STAT pathway in proliferation and differentiation of neural stem cells and neural progenitor cells is discussed; secondly, the time-dependent effect of JAK-STAT pathway in reactive astrocytes to reveal their capability of neuroprotection is revealed and lastly, we focus on how the astrocyte-secretory polypeptides (astrocyte-derived cytokines and trophic factors) accomplish neuroprotection via the JAK-STAT pathway.
Publication type: Journal: Review
Source: EMBASE

54.Title: Ultrasound findings of the urinary tract in patients with spinal cord injury: a study of 1005 cases.
Citation: Spinal Cord, February 2015, vol./is. 53/2(139-44), 1362-4393;1476-5624 (2015 Feb)
Author(s): Guzelkucuk U, Demir Y, Kesikburun S, Aras B, Yasar E, Tan AK
Language: English
Abstract: STUDY DESIGN: Retrospective chart review.OBJECTIVES: To document urinary tract abnormalities (UTAs) in patients with spinal cord injury (SCI) and to assess demographic and clinical features associated with UTA detected via ultrasound (US).SETTING: Turkish Armed Forces Rehabilitation Center, Ankara, Turkey.METHODS: The medical and radiological records of all patients with SCI were screened. Variables in each patient with SCI, including age at the time of the US examination, gender, etiology, level and severity of SCI, time since injury, bladder management methods and findings of urinary tract US, were reviewed and analyzed.RESULTS: Data were obtained from 1005 patients during the 6-year study period (2008-2013). The mean age was 35.67+/−14.79 years and the male-female ratio was 2.84:1. Trabeculated bladder (TB) was observed in 35.1% of the patients, bladder calculi in 6%, renal calculi in 6%, hydronephrosis in 5.5% and renal atrophy in 1.2%. Bladder calculi, renal calculi and renal atrophy were observed in patients with TB at higher rates than in those without TB (P=0.001, 0.036 and 0.004, respectively). The association of TB with hydronephrosis was very close to significance level (P=0.052).CONCLUSION: A large number of SCI patients had UTAs including TB, renal and bladder calculi, hydronephrosis and renal atrophy. The time since injury, level and severity of SCI and bladder management method may influence development of UTA. In addition, TB may be a helpful parameter for predicting UTA in SCI patients.
Publication type: Journal Article
Source: MEDLINE
Full text: Available Nature Publishing Group at Spinal Cord

55.Title: Virtual feedback for motor and pain rehabilitation after spinal cord injury.
Citation: Spinal Cord, December 2014, vol./is. 52/12(860-6), 1362-4393;1476-5624 (2014 Dec)
Author(s): Roosink M, Mercier C
STUDY DESIGN: Interventions using virtual feedback (VF) impact on motor functions and pain and may be relevant for neurorehabilitation after spinal cord injury (SCI) in which motor dysfunctions and (concomitant) pain are frequently observed. Potential mechanisms underlying VF include a modulation of cortical sensorimotor integration, increased therapy engagement and distraction from effort and pain. Still, the optimal parameters for VF and their technical implementation are currently unknown. OBJECTIVES: To provide an overview of interventions that have used VF to improve motor functions or to reduce pain after SCI. METHODS: Literature review. RESULTS: A total number of 17 studies were identified. VF interventions commonly focused on improving motor functions (n=12) or reducing pain (n=4). Only one study assessed both motor functions and pain. Studies generally report beneficial effects. However, the evidence is of low-level quality and many practical as well as theoretical issues remain unclear. Remaining knowledge gaps include: (1) optimal VF system characteristics, (2) the impact of different VF modalities and tasks, (3) dose-response relationships and (4) the identification of patients that are likely to benefit from VF. Future work should start by closing these knowledge gaps using systematic and controlled multi-session interventions and by assessing the underlying mechanisms involved. CONCLUSION: These results provide an important incentive to further assess the potential of VF interventions to simultaneously improve motor functions and reduce pain after SCI, which could contribute to better neurorehabilitation outcomes after SCI.

Publication type: Journal Article, Research Support, Non-U.S. Gov't
Source: MEDLINE
Full text: Available Nature Publishing Group at Spinal Cord

Who decides? A qualitative study on the decisional roles of patients, their caregivers and doctors on the method of bladder drainage after spinal cord injury.

Citation: Spinal Cord, February 2015, vol./is. 53/2(130-4), 1362-4393;1476-5624 (2015 Feb)
Author(s): Engkasan JP, Ng CJ, Low WY
Language: English

STUDY DESIGN: Qualitative study using individual in-depth interviews. OBJECTIVE: To explore the roles of patients, their caregivers and doctors when making decisions on the method of bladder drainage after spinal cord injury (SCI). SETTING: Five public hospitals in Malaysia. METHODS: Semi-structured (one-to-one) interviews with 17 male patients with SCI, 4 caregivers and 10 rehabilitation professionals. RESULTS: Eight themes describing the respective decisional roles of patients, their caregivers and doctors emerged from the analysis: patient's right and responsibilities, patient as an informed decision maker, forced to accept decision; surrogate decision maker, silent partner; doctor knows best, over-ride patient's decision, or reluctant decision maker. Both patients and doctors acknowledged the importance of patient autonomy but not all patients had the chance to practice it. Some felt that they were forced to accept the doctor's decision and even alleged that the doctor refused to accept their decision. Doctors considered the caregiver as the decision maker in cases that involved minors, elderly and those with tetraplegia. Some patients considered bladder problems an embarrassing subject to discuss with their caregivers and did not want their involvement. Doctors were described as knowledgeable and were trusted by patients and their caregivers to make the most appropriate option. Some doctors were happy to assume this role whereas some others saw themselves only as information providers. CONCLUSIONS: A paternalistic model is prevalent in this decision-making process and there is a discrepancy between patients' preferred and actual decisional roles.

Publication type: Journal Article
Source: MEDLINE
Full text: Available Nature Publishing Group at Spinal Cord

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