

Spinal Cord Injury

Recommendations of WFNS Spine Committee 2019

Recommendations for Clinical Assessment and Classification of Spinal Cord Injury (SCI)

- * ASIA Impairment Scale (**AIS**) described by the American Spinal Cord Injury Association (**ASIA**) is recommended as the preferred clinical evaluation tool for acute neurological assessment in patients with spinal cord injury.
- * The Spinal Cord Independence Measure (SCIM III), may be preferred to assess the functional abilities and impairment in the follow up of patients with chronic spinal cord injury.
- * The International Spinal Cord Injury Basic Pain Data Set (ISCIBPDS) may be the preferred scale to evaluate the pain on the chronically injured patient.

Recommendations for Emergency Care and Early Management of SCI

- * Early surgery (within 8 hours) should be performed in most cases of spinal cord injury.
- * Corticosteroids are not indicated in the majority of acute phase of SCI.
- * If feasible, SCI patients need to be treated in a specialized level 1 neurotrauma center.

Recommendations for Cardiopulmonary Management of SCI

- * The mean arterial pressure (MAP) above 85 for 7 days in patients with spinal cord injury improves neurological outcome. Correction of hypotension in spinal cord injury (systolic blood pressure < 90 mmHg) when possible and as soon as possible is recommended.
- * Patients with spinal cord injury suffer from cardiac issues including hypotension and bradycardia, and it is worse in complete injuries.
- * In cervical or high thoracic lesions with both hypotension and bradycardia, a drug like norepinephrine with chronotropic and inotropic effects as well as vasoconstrictor properties may be required.
- * Level, completeness of the injury, age, previous disease, and tachypnea at admission are associated with a higher likelihood of respiratory complication, hence these patients should be aggressively nursed.

Recommendations for Pharmacological Therapy of Acute SCI

- * There is not good evidence that high doses of Methylprednisolone sodium succinate (MMPS) administration for acute spinal cord injury is beneficial, in correlation with its high rate of complications.
- * In selected young patients with acute SCI 24-hours infusion of high dose MMPS administered within 8 hours of injury can be suggested.
- * Against acute spinal cord injuries, there is no pharmacological agent with high evidence level that actually can be administered.

Recommendations for Spinal Cord Injury Without Radiographic Abnormality (SCIWORA)

- * SCIWORA is a clinical-radiological condition of spinal cord injury without radiographic or CT evidence of fracture, dislocation, disc and ligaments damage or signs of instability.
- * If the patient, after cervical trauma, has neurologic symptoms, but his/her X-Ray/CT findings are negative, MRI should be evaluated.
- * MRI findings in patients with SCIWORA correlate with symptoms and predict neurologic outcome.
- * In patients with SCIWORA, conservative treatment should be preferred before surgical treatment.

Recommendations for the Role of Regenerative Therapies in SCI

- * We are not able to make any recommendation regarding efficacy of stem cell therapy in SCI treatment.

Recommendations for Impact of Clinical Syndromes (Anterior Cord Syndrome, Central Cord Syndrome) on Outcomes of SCI

- * Traumatic Central Cord Syndrome (TCCS) has a good prognosis, although factors such as older age and more severe neurological damage during development are associated with a lower likelihood of neurological recovery.
- * Conservative treatment (with use of hemodynamic support - MAP 85-90 mm Hg) remains the most useful treatment for TCCS.
- * To improve the outcomes of TCCS treatment, when there are signs of spinal instability or continuing compression of the spinal cord, the possibility of early surgery should be considered.

Recommendations for Impact of Radiological Findings on Outcomes of SCI

- * Presence of facet dislocation on CT is suggestive of poor neurological outcome.
- * MRI T2 sequences is an accepted method to rapidly screen patients with SCI.
- * Predictive findings on T2 sequences, including sagittal grade, length of injury, maximum canal compromise, and maximum spinal cord compression, axial grading score provides the best and easy means to predict outcome.
- * Diffusion tensor imaging (DTI) sequences may be promising to predict outcome in both acute and chronic spinal injury patients.

Recommendations for Impact of Decompressive Surgery on Outcomes of SCI

- * Decompressive surgery is an effective treatment in SCI and must be performed as soon as possible. Data suggest that better outcomes are correlated with surgery performed within 24 hours from trauma.
- * There is no clear evidence that non operative treatment is better or equivalent of delayed decompression.

Recommendations for Functional Electrical Stimulation for SCI Sequelae

- * Functional electrical stimulation is promising and in adjunct to rehabilitation. It may improve:
 - *The range of motion, muscle size and strength
 - *Functional use of the hands, arms or legs
 - *Blood circulation and health of the heart
 - *Aerobic and metabolic conditioning and overall fitness levels
 - *Ability to prevent loss of bone density and thus preventing life threatening complications (fractures, pressure ulcers, infections)

Recommendations for Rehabilitation for SCI

- * Timely detection and correction of malnutrition improves the prognosis of patients after SCI.
- * For patients with urinary retention after SCI, intermittent catheterization is recommended.
- * Biodegradable collagen type I is effective in the treatment of decubital dystrophic ulcers.
- * Permanent and continuous physical therapy is recommended to patients in the second and third stages of medical rehabilitation.
- * Hydrotherapy, when feasible, is recommended for patients with spinal cord injury.

Recommendations for Spasticity and Pain Management after SCI

- * DREZotomy can be a good treatment option for the management of central pain and spasticity in patients with complete SCI.
- * Dorsal myelotomy is a therapeutical option for patients with complete SCI having spasticity and pain.
- * Spinal cord stimulation may be an option to treat chronic neurophatic pain secondary to SCI.
- * Intrathecal Baclofen may be an option for the treatment of spasticity secondary to SCI.