Traumatic spinal cord injury medical treatment

- Leisure-time Physical Activity in People with Spinal Cord Injury: A Population-based Community Sample
- Phenserine Mitigates Neuroinflammation, Apoptosis, and Behavioural Deficits to Enhance Motor Function and Recovery in a Mouse Model of Spinal Cord Injury
- Clinical experience implanting a miniature externally powered vagus nerve stimulator
- Case Report: Lateral C1-C2 puncture for intrathecal baclofen therapy: an alternative effective and safe approach after spinal cord injury
- Development and Validation of Machine Learning Models for Predicting 7-Day Mortality in Critically Ill Patients with Traumatic Spinal Cord Injury: A Multicenter Retrospective Study
- Injectable ion-coordinated double-network conductive hydrogel for spinal cord injury repair
- Fundamentals of Acute Care for Patients with Traumatic Spinal Cord Injury
- Special Pediatric Considerations in the Management of Severe Traumatic Brain Injury and Spinal Cord Injury

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Medications may be prescribed to manage pain, reduce inflammation, and prevent complications.

see Methylprednisolone for Spinal cord injury.

The efficacy of drugs is severely limited owing to the poor penetration of the blood-spinal cord barrier (BSCB). Inspired by cell chemotaxis and related chemokines production at the lesion sites of SCI, the microglial membrane is selected to construct a drug delivery system with the ability to cross the BSCB and target the lesions. PR@MM is prepared based on the assembly of polylactic-co-glycolic acid (PLGA) and resveratrol (RSV) followed by microglial membrane (MM) coating. Compared to that of the uncoated nanoparticles, the enrichment of PR@MM at the lesion sites of SCI increases, which is beneficial to achieve lesion targeting of RSV and exert therapeutic functions. Both in vitro and in vivo experiments demonstrate that PR@MM has abilities to scavenge reactive oxygen species and anti-inflammatory effects, which ultimately promotes the recovery of locomotory function after SCI. Therefore, this microglial membrane-based drug delivery system provides a promising biomimetic nanomedicine for targeted therapy of SCI [1)].

Currently, there are no U.S. Food and Drug Administration-approved pharmacological therapies to augment motor function and functional recovery in individuals with traumatic SCI.

Long-term neurological recovery continues to be limited. In recent years, a number of exciting neuroprotective and regenerative strategies have emerged and have come under active investigation in clinical trials, and several more are coming down the translational pipeline. Among ongoing trials are RISCIS (riluzole), INSPIRE study (Neuro-Spinal Scaffold), MASC (minocycline), and SPRING (VX-210). Microstructural MRI techniques have improved our ability to image the injured spinal cord at high resolution. This innovation, combined with serum and cerebrospinal fluid (CSF) analysis, holds the promise of providing a quantitative biomarker readout of spinal cord neural tissue injury, which

may improve prognostication and facilitate stratification of patients for enrollment into clinical trials. Given evidence of the effectiveness of early surgical decompression and growing recognition of the concept that “time is spine,” infrastructural changes at a systems level are being implemented in many regions around the world to provide a streamlined process for transfer of patients with acute SCI to a specialized unit. With the continued aging of the population, central cord syndrome is soon expected to become the most common form of acute traumatic SCI; characterization of the pathophysiology, natural history, and optimal treatment of these injuries is hence a key public health priority. Collaborative international efforts have led to the development of clinical practice guidelines for traumatic SCI based on robust evaluation of current evidence [2].

Minocycline-Loaded Poly(α-Lipoic Acid)-Methylprednisolone Prodrug Nanoparticles can mitigate secondary inflammation and preserve motor function following experimental TSCI, which suggests their potential for clinical application [3].

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Wang W, Li S, Li H, Guo P, Lyu C, Ye P, Yang W, Wang J, Yu D, Lu G, Tan H. Neuroprotective Effects of Microglial Membrane-Derived Biomimetic Particles for Spinal Cord Injury. Adv Healthc Mater. 2023 Sep 8:e2301592. doi: 10.1002/adhm.202301592. Epub ahead of print. PMID: 37681300.
2)
Badhiwala JH, Ahuja CS, Fehlings MG. Time is spine: a review of translational advances in spinal cord injury. J Neurosurg Spine. 2018 Dec 20;30(1):1-18. doi: 10.3171/2018.9.SPINE18682. Review. PubMed PMID: 30611186.
3)
Lin F, Liu Y, Luo W, Liu S, Wang Y, Gu R, Liu W, Xiao C. Minocycline-Loaded Poly(α-Lipoic Acid)-Methylprednisolone Prodrug Nanoparticles for the Combined Anti-Inflammatory Treatment of Spinal Cord Injury. Int J Nanomedicine. 2022 Jan 7;17:91-104. doi: 10.2147/IJN.S344491. PMID: 35027828; PMCID: PMC8752067.