

New literature review assesses benefits of stem cells for treating spinal cord injuries

29 April 2016

Stem cell therapy is a rapidly evolving and promising treatment for spinal-cord injuries. According to a new literature review, published in the April issue of the *Journal of the American Academy of Orthopedic Surgeons* (JAAOS), different types of stem cells vary in their ability to help restore function, and an ideal treatment protocol remains unclear pending further clinical research.

Approximately 230,000 Americans suffer life-changing acute spinal cord injuries each year. These injuries lead to neurological compromise through an inflammatory response and cell death within the spinal cord. But stem cells are considered promising because they are self-renewing human cells that can differentiate into one or more specific cell types. Ideally, treatments for [spinal cord injuries](#) would limit existing cell death, stimulate growth from existing cells, and replace injured cells.

"Stem cell treatment is a realistic hope for spinal cord injury patients," said lead author Gregory D. Schroeder, MD, spine research and clinical fellow at the Rothman Institute at Thomas Jefferson University in Philadelphia. "There is high-quality basic science research, and clinical trials in humans are underway."

The authors evaluated research findings on different types of stem cells:

- Mesenchymal stem cells (MSCs), most commonly harvested from bone marrow, can prevent activation of inflammatory responses that lead to cell death. Functional recovery using MSCs in spinal cord injury patients has been mixed.
- Peripheral nervous system stem cells can secrete nerve growth factor to aid cell growth and temporarily act as replacement cells. Limited studies are promising, with one showing marked improvement in

sensory scores but no improvement in motor function.

- Embryonic stem cells, although controversial, are resilient, and many animal studies have shown that [embryonic stem cells](#) limit inflammatory responses and promote cell growth. Very few human studies have been published about embryonic stem cell treatment for spinal cord injury patients.
- Induced pluripotent [stem cells](#) (iPSCs), derived from adult skin cells, are the newest stem cell being investigated for use in treating [spinal cord](#) injuries, but to date, no clinical studies have been published. Early animal studies indicate these cells offer benefits similar to those of embryonic cells without the ethical issues.

More information: Gregory D. Schroeder et al, The Use of Cell Transplantation in Spinal Cord Injuries, *Journal of the American Academy of Orthopaedic Surgeons* (2016). [DOI: 10.5435/JAAOS-D-14-00375](#)

Provided by American Academy of Orthopaedic Surgeons

APA citation: New literature review assesses benefits of stem cells for treating spinal cord injuries (2016, April 29) retrieved 24 October 2022 from <https://medicalxpress.com/news/2016-04-literature-benefits-stem-cells-spinal.html>

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