

## Research Provides New Hope for Spinal Cord Injury Patients

*by John Demas on 01/06/11 at 12:55 pm*

Medical and scientific researchers continue searching for new ways to regenerate parts of the central nervous system so that injured spinal cords can be fully or partially repaired. According to the National Institute of Neurological Disorders and Stroke (NINDS), this research revolves around four basic principles or goals. In order to repair **spinal cord injuries**, experts believe you must:

- Make sure that all of the healthy nerve cells surrounding the damaged area are fully protected from further injury;
- Find a way to replace the nerve cells that have been damaged;
- Cause central nervous system (CNS) axons to grow again, while carefully tending to their connections; and
- Find a way to retrain the CNS circuits so that body functions can be adequately restored.

### Factors Complicating this Research

The spinal cord and the parts of the central nervous system it protects are incredibly complex. All of the signals that create and control body movements are supposed to flow between the brain and parts of the spinal column. Since it can be difficult to explain even a healthy person's neurological functions, it's not surprising that researchers are finding it hard to discover better ways to repair damaged spinal cord systems.

In fact, the entire spinal cord environment keeps changing after a serious injury for many weeks, if not months. This complicates the researchers' tasks since they must keep second-guessing how each injured person's brain is *currently* interacting with its damaged spinal cord. Furthermore, different therapies will be needed to address the various stages of change or recovery.

## Stem Cell Research Leading to Helpful New Therapies

Stem cell research offers new insights into how various types of cells communicate with each other within the human body. Although stem cells were first harvested from embryos, they can now be created in less controversial ways.

Stem cells are unique in that they can (1) divide and renew themselves and (2) under specific experimental conditions, they can become what scientists refer to as “**tissue- or organ-specific cells** with special functions.” This means that we are probably moving much closer to the day when stem cells will be used to regenerate and heal the different injured parts of the spinal cord (and other parts of our bodies).

## Fairly Recent Discoveries and New Research Goals

- Early drug therapy. Spinal cord injury (SCI) patients and their doctors remain pleased with the adrenal corticosteroid drug named methylprednisolone. When administered to a SCI patient within eight (8) hours of a new injury, it can limit how far the SCI can spread and worsen. So far, this drug appears to have relatively few side effects.
- New rehabilitation therapies. By requiring SCI patients to retrain their neural circuits through “**forced motion and electrical stimulation** of muscle groups,” many of them are regaining lost functional capabilities.
- In future years, researchers hope that agents known as “receptor antagonists” can help prevent some of the secondary nerve cell damage caused by (the excess production of) the neurotransmitter glutamate after an SCI;
- Researchers are now searching for new ways to reduce unhealthy spinal cord inflammation after an SCI due to the large number of immune cells that rush into the damaged spinal cord after injury; and
- Efforts are being made to find reliable ways to use hypothermia (the lowering of an SCI patient's body temperature to about 92 degrees) for set periods of time after SCI

injuries to reduce added damage and to promote the retention of as many functional capabilities as possible.

These are just a limited number of the many exciting new discoveries and areas of intensive research that offer **spinal cord injury** patients hope for additional improvements in their lives and those of new SCI patients.

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