

# Spinal Cord Injury

## What is spinal cord injury (SCI)?

The adult spinal cord is the major bundle of nerves that carries nerve impulses between the brain and the rest of the body. Nerves within the spinal cord (upper motor neurons) carry messages back and forth from the brain to the spinal nerves along the spinal tract. Lower motor neurons branch out from the spinal cord to the other parts of the body, carrying sensations from the skin and other areas to the brain.

Injury to the spinal cord causes loss of function of the nerves, limbs and organs below the site of the injury.

The spinal cord does not have to be severed in order for a loss of function to occur. In fact, for most people with a spinal cord injury, the damage is a result of compression or bruising.

### Research at QBI

Research under way at the Queensland Brain Institute (QBI) and elsewhere in the world suggests that an effective treatment for spinal cord injury is finally coming closer to a reality. More therapies have been developed in the past decade than in the previous 100 years. These achievements have resulted from basic scientific research, and the subsequent translation of these discoveries into clinical practice.

QBI's Director, Professor Perry Bartlett, is the lead scientist developing a

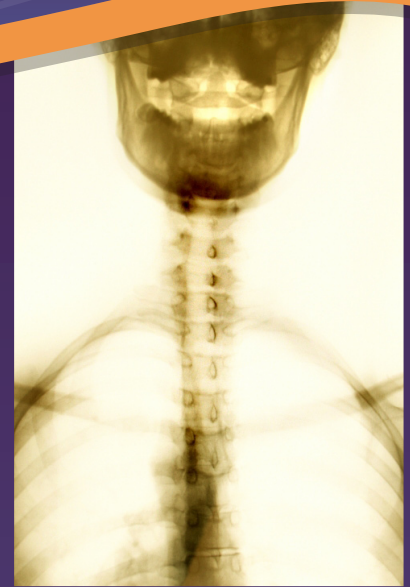
drug-based treatment for spinal cord injury that (a) stimulates re-growth of axons through a spinal cord lesion and (b) works to reduce glial scarring. The glial scar is a dense mechanical – and probably biochemical – barrier for regenerating axons that forms at the site of neural damage. It is thought that such a drug may also play a role in treating neural trauma.

Research in a mouse model of spinal cord injury has shown that removing the molecule EphA4 in mice with damaged spinal cords leads to regeneration of nerve processes and dramatic changes in limb usage.

Professor Bartlett says further research with mice would be directed towards developing therapeutics that could block the action of this molecule. If this proved to be effective, it would provide a prospective agent to be used in human trials.

While still some time away from producing a therapeutic treatment for spinal cord injury, recent discoveries together with emerging scientific developments provide encouraging evidence that a treatment for spinal cord damage is possible.

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### Fast facts

- In Australia, there are about 20,000 people living with a disability as a result of spinal cord injury.
- The ongoing cost of such injuries, in terms of acute care, rehabilitation and lost income, amounts to nearly one billion dollars per year.
- There are 300-400 new cases of spinal cord injury in Australia each year.
- About 30% of sufferers are aged between sixteen and thirty.
- Approximately 50% of all spinal cord injuries occur through motoring accidents and around 10% through sporting accidents.

Source: SpinalCure Australia

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