

Surgery and Recovery

- All surgeries are done in the operating room under general anesthesia and after the surgery you will stay in the hospital for 2 nights.
- A drain (if placed) is removed about one week after surgery.
- Once the skin is healed (approximately 2-4 weeks), pre-surgery arm and all other activities may be resumed.
- Surgery involves cutting and reattaching nerves. There is a significant length of time to wait while working connections between the nerves and muscles regenerate.
- A nerve grows at an inch per month or a millimeter per day. Time required to gain over one year.
- Your brain will need to relearn how to use and re-strengthen the muscles. This is done through therapy with an occupational or physical therapist.
- Nerve transfer surgery may provide some improved hand and finger function but function will not return to pre-spinal cord injury.

Example of a Nerve Transfer Surgery in Spinal Cord Injury

“Brachialis to AIN Transfer”

- The donor nerve is attached to the brachialis muscle.
- In C6 & C7 level quadriplegia this patient works to help flex the muscle.
- It is expendable because the biceps muscle also flexes the elbow.
- An incision is made in the upper arm the donor nerve is cut and re-attached to the muscles that bend your thumb and index finger.
- The nerve is then re-attached to the muscles in the forearm that provide pinch by bending the tips of the thumb and index finger.

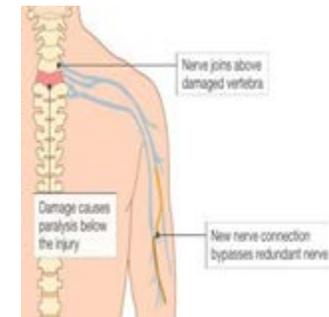
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Division of Plastic & Reconstructive Surgery

Nerve Transfer Surgery in Patients with Spinal Cord Injury



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Nerve Transfer Surgery

Who can benefit from nerve transfer surgery?

- Some patients with cervical level **spinal cord injury**.
- This surgery relies on working nerves above the C6 and C7 level; it will not benefit patients with C1-C5 level injuries who have not arm function.

How does nerve transfer surgery work in spinal cord injury?

- The spinal cord is part of the central nervous system; when cells in the spinal cord are injured, they cannot be regenerated or repaired. **This is different than peripheral nerve injury** in which the nerve can regrow and recover function in a process called 'nerve regeneration'.
- Nerves leaving the spinal cord above the level of injury continue to work following the injury. You have control over the muscles that are innervated by these nerves and sensation is intact in those areas.

- Nerves that leave the spinal cord below the level of injury are no longer connected to the brain and you can no longer send a signal from the brain to the nerve to the muscle to make it work.
- The muscles below the level of injury are 'healthy' they just can no longer be controlled by the brain.

What is a nerve transfer surgery?

- A donor nerve is taken from a less important muscle and transferred to a new muscle to help provide a more critical function such as grip or pinch.
- The transferred nerve is rewired to the muscle that is no longer working following the injury. Once the nerve regenerates, function that was lost is restored.
- Nerve transfers can bypass the damaged area to deliver signals to the muscle that was previously disconnected.
- Nerve transfer surgery can be done at any time following a spinal cord injury. **This is different from peripheral nerve injury in which the damaged nerve must**

regenerate and reach the muscle in less than one year.

Other Procedures

Not everyone is a candidate for nerve transfer surgery. You may be a candidate for other procedures such as tendon transfers, joint fusion, or anti-claw procedures. Talk to your doctor about other options.

Prior to surgery...

- The segment of spinal cord injury must be short. This is often confirmed by a test called an EMG or nerve conduction study.
- Your doctor will assess your joints to ensure they are supple and not stiff.
- You will undergo an assessment to confirm expendable donor nerves are available.
- Postoperative physical therapy must be available.

APPOINTMENTS

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