CQ HAND + UPPER LIMB
SPECIALIST ORTHOPAEDIC SURGEON

PATIENT INFORMATION

# Hand Tendon and Nerve Injuries

The tendons and nerves on the palm side of the hand sit in narrow channels close to the skin. Cuts and lacerations often involve more than one structure.

Kieran Hirpara 4.0

## What you're feeling

You may notice pain, numbness, or weakness in your hand or wrist. This often happens after an injury. If you had a ballistic injury, such as a gunshot wound, the presence of a fracture increases the chance that both nerves and tendons are damaged. This combination raises the risk of long-term disability. You might also feel a painful lump near the site of a nerve injury. This is called a neuroma. It can be very uncomfortable and makes daily tasks difficult.

Simple movements may become hard. You might struggle to grip objects, reach behind your back to fasten a bra, or tuck in a shirt. If you have a trigger thumb, your finger may lock or catch when you try to straighten it. This is common in children but can happen at any age. The pain often flares up after activity or when you first wake up in the morning. You might find it hard to sleep on the side that hurts.

Your surgeon will look for signs of nerve damage. Only 24% of repaired nerves regain sensory recovery close to or equivalent to estimated pre-injury levels. This means you might not feel sensation fully return, even after surgery. If you have a high radial nerve injury with a defect of nine centimeters or greater, time is critical. An attempt at nerve reconstruction before proceeding to tendon transfers appears indicated within 8 months. If repair is not possible, tendon transfer is a useful option to restore function.

Tendinopathies of the hand and wrist are common. You might feel ache or stiffness that worsens with use. Treatment is similar for most people, advancing both nonsurgical and surgical management. If you have an injury pattern that may lead to nerve injury, prompt referral to an upper extremity specialist is important to optimize outcomes. Do not wait for symptoms to resolve on their own. Early care helps prevent further complications and supports better recovery.

## What's actually happening

Your hand relies on a complex system of tendons and nerves working in perfect sync. Tendons are like strong ropes that connect your muscles to your bones, allowing you to grip and release objects. Nerves act as the

CQ HAND + UPPER LIMB
Dr Kieran Hirpara — Specialist Orthopaedic Surgeon
Suite 2, Level 1, Mater Private Hospital Rockhampton, 31 Ward Street, The Range, QLD 4700
Phone 07 4863 6556 · office@cqupperlimb.com.au · cqupperlimb.com.au

electrical wiring, sending signals from your brain to tell those muscles when and how to move. When these structures are injured, the communication breaks down, and the mechanical link is weakened.

In many cases, your surgeon may recommend a tendon transfer. This procedure moves a healthy tendon to replace one that is damaged or no longer working. It is a useful option when repairing the original nerve does not restore useful function, or when the nerve injury is too severe to fix directly. By rerouting these "ropes," your surgeon can restore essential movements, such as extending your thumb or gripping objects. This approach often helps you return to work and daily life faster than waiting for a nerve to heal on its own.

Nerve injuries can also disrupt sensation and muscle control. For thumb or fingertip repairs, regaining sensation is critical, accounting for 40% of the goal, while length and appearance make up the other 50%. If a nerve is severed with a gap of nine centimeters or greater, your surgeon might attempt nerve reconstruction within eight months before considering tendon transfers. In some cases, combining nerve repair with tendon transfer provides better function than either procedure alone.

Even with reduced strength or range of motion, hand function can remain good. You may find that gripping smaller objects is harder than gripping larger ones, and your extension strength might be about 20% lower in the operated hand compared to the other side. However, clinical scores often show favorable results despite these physical limitations. Your surgeon uses careful physical exams and imaging to diagnose the issue accurately, aiming to limit stiffness while preserving as much mobility as possible.

## What we can do about it

Your surgeon will first assess the extent of the injury to determine the best path forward. For many nerve and tendon issues, non-surgical care is the starting point. You may be advised to rest the hand and avoid activities that cause pain. Physiotherapy plays a key role in this phase. It aims to maintain joint movement and prevent stiffness while the tissues heal. In some cases, such as atraumatic posterior interosseous nerve palsy, a trial of nonoperative management is advisable. You should monitor your strength closely. If you see no sign of muscle recovery after 6 weeks of observation, or if there is progressive weakness, your surgeon will likely recommend further investigation or surgery.

Medical management focuses on controlling pain and reducing inflammation to help you function daily. Your surgeon may prescribe pain medication or anti-inflammatory drugs. For specific conditions like trigger thumb in children, surgical release of the tendon sheath is effective and carries minimal risk of recurrence or nerve damage. In cases of nerve compression, such as superficial radial nerve issues, neurolysis (releasing pressure on the nerve) may offer pain relief, though success is not guaranteed. For tendon injuries, early presentation and clean wounds allow for primary repair. If the wound is contaminated or you present late, secondary repair using a tendon graft is recommended. Your surgeon will use imaging like MRI or ultrasound to plan these treatments and check for issues like tendon separation or entrapment.

Surgery is considered when conservative care does not restore function or when the injury is severe. For radial nerve injuries, tendon transfer is a useful option to restore movement when nerve repair is not possible or has failed. It may be the procedure of choice if early return to work is important. In cases of high radial nerve injuries with defects of 9 cm or greater, your surgeon may attempt nerve reconstruction within 8 months before

considering tendon transfers. For digital nerve injuries, evidence for good recovery after single repair is poor, with only 24% of repaired nerves regaining sensory levels close to pre-injury status. In complex cases involving tetraplegia, combined nerve and tendon transfer may be used to restore grasp and release, though more research is needed to confirm its superiority. Your surgeon will weigh the benefits of restoring function against the risks to donor nerves and future options.

## What to expect

Your recovery depends on the specific injury and the treatment chosen. If your surgeon repairs a nerve, you should know that good sensory recovery is not guaranteed. Only 24% of repaired nerves regain sensation close to or equivalent to pre-injury levels. This means most people will have some lasting change in feeling. However, if you have a high radial nerve injury, better outcomes are linked to repair within six months, a defect length of less than five centimeters, or grafting with three or more donor nerve cables.

If nerve repair is not possible or does not restore useful function, your surgeon may recommend a tendon transfer. This procedure reroutes healthy tendons to replace lost movement. It is a useful option for radial, median, or ulnar nerve injuries. For radial nerve palsy, tendon transfers often provide superior clinical outcomes compared to nerve transfers or grafts. This approach is particularly important if early return to work and social activities is a priority for you. In some cases, combining nerve repair with tendon transfer shows no detrimental results and may improve function over tendon transfer alone.

Healing takes time. For high radial nerve injuries with large gaps of nine centimeters or greater, an attempt at nerve reconstruction is indicated within eight months before proceeding to tendon transfers. If you undergo primary tendon repair, early active mobilization is beneficial and compares favorably with older methods. Most patients see significant improvements in function throughout the follow-up period. While complications like infection or stiffness can occur, major issues are uncommon. Most adverse outcomes are short-term pain and swelling. You should expect a gradual return of strength and sensation, with the timeline varying based on the severity of your initial injury and the specific procedure performed.

## When to see someone

Ask for a specialist review if you have persistent pain that does not improve with rest, or weakness and instability in your hand. Seek prompt care if your hand locks, gives way, or if symptoms interfere with your sleep or work. Sudden worsening of symptoms also warrants immediate attention. Evidence shows that fractures are linked to a higher risk of nerve and tendon injuries, which can lead to long-term disability. Early evaluation helps optimize outcomes. If you suspect a nerve injury, timely referral is key to restoring function and preventing complications like painful neuromas or permanent loss of sensation.

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