



### What happens when a nerve is injured?

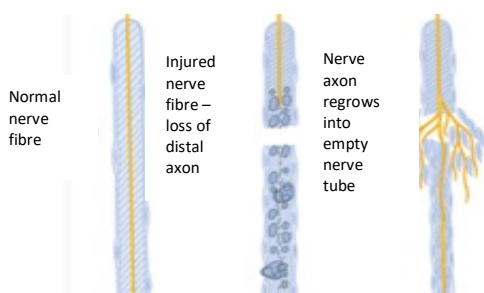
A nerve is made up of individual nerve fibres (**axons**) bundled up into groups (**fascicles**) held within the nerve sheath (**epineurium**). A nerve can be injured by a laceration when the nerve bundle is divided, or by crush or traction which can either bruise or disrupt either just the individual nerve fibres within the nerve or the entire nerve itself. A nerve that is only bruised can recover function spontaneously over a few weeks, while a nerve that has been disrupted or divided will need to be repaired.

When a nerve fibre (axon) is divided the part of the nerve fibre beyond the level of the injury – the part closest to the periphery – dies and is absorbed leaving the nerve sheath as an empty tube. The nerve above the level of injury begins to regenerate and if it can find its way back in the empty nerve sheath tube, with regrow slowly and reconnect with the skin and muscles to restore function. This process is a slow one with nerve regrowth of 1 mm/day at best. It is also incomplete with some nerve fibres getting lost or not regrowing, however, useful recovery can be achieved.

If the regenerating nerve fibres cannot find their normal path, they can form a bundle of nerves at the level of the injury, a **Neuroma**. This is often a very tender lump which when tapped or knocked can produce pain felt in the area the nerve originally supplied.

#### How are they diagnosed?

The symptoms of a nerve injury are numbness or altered sensation in the distribution of the damaged nerve and weakness of the muscles it supplies. Your surgeon will assess this by examining the upper limb in detail. In longer standing injuries, there may be changes in the skin such as dryness and loss of the normal fingerprints in affected fingers, and wasting of particularly muscles. In some circumstances, the diagnosis can be confirmed with **Nerve Conduction Studies** and imaging with Ultrasound or MRI.



#### How are they treated?

Where the injury is diagnosed at the time of a laceration, your surgeon will repair the injury at the time with a microsurgical repair of the **Epineurium** to allow the nerves to regrow back into the empty nerve sheath beyond the injury. Occasionally a **Nerve Graft** will be needed to bridge a gap at the site of injury. Your surgeon will discuss this with you if this is likely to be required. If the injury is a crush or traction injury, it is likely your surgeon will delay exploration and repair to see if it will recover spontaneously. If it doesn't show signs of recovery, then reconstruction of the nerve function will be required. This can be a complicated procedure and there may be a number of ways of achieving this that your surgeon will discuss with you.

