

Hand therapy department

Peripheral nerve injury in the hand and arm

Information for patients

Introduction

The purpose of this leaflet is to help you understand the effects of your nerve injury and what to expect during your recovery. Recovery from nerve damage can be a long, slow process and if you understand your condition, it can help your recovery.

What is a peripheral nerve?

The peripheral nervous system is the network of nerves that lie outside the central nervous system (the brain and spinal cord). For example, the nerves in your hands, arms and feet.

Peripheral nerves are like two-way electrical circuits carrying information up and down between your brain and your arm and hand. Each nerve contains many fibres, much like the fibres inside an electrical cable.

There are different types of peripheral nerves with their own specific functions, including:

- sensory nerves – responsible for transmitting sensations, such as pain and touch
- motor nerves – responsible for controlling muscles
- autonomic nerves – responsible for regulating automatic functions of the body, such as blood pressure and bladder function

There are three main nerves in your arm, the radial, median and ulna nerve, see image below. Each one of these nerves supplies a different group of muscles to give specific movements in your hand/ arm and supplies a specific area of the skin to allow you to feel touch.

You have injured the _____ nerve

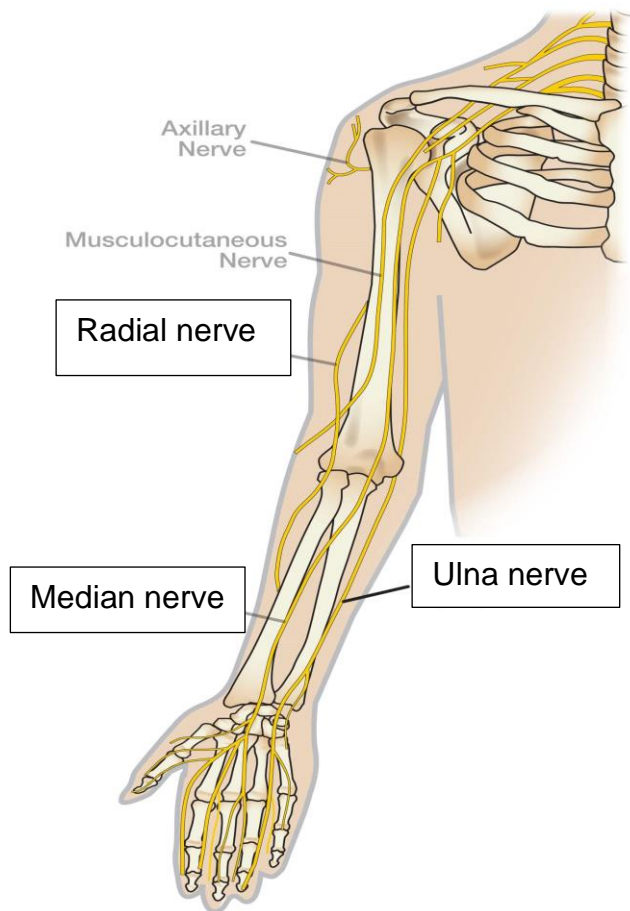


Diagram adapted from the American Society for Surgery of the Hand

What happens when a nerve is injured?

Nerves are very fragile and can be easily damaged. They can be damaged by physical injury to the nerves, a viral infection, or due to drinking too much alcohol, for example.

There are different severities of nerve injury ranging from mild bruising to a complete cut of the nerve.

Nerve injuries can be classified as three different types.

1. The mildest is where the nerve remains intact but is bruised. In this type of injury you might feel temporary weakness or less sensation.
2. The second type is when there is damage to some of the nerve fibres. The damaged fibres go through a process of regeneration which takes a bit longer than the first type of injury. It is difficult to predict how long the recovery will take with these injuries, as it depends on how many fibres need to regenerate or regrow.
3. The third type is when the nerve is severely damaged, usually from a cut. With this injury the nerve usually needs surgery to repair it. After surgery, the nerve fibres below the

injury die off and then start to regrow. It usually takes a month before nerves start to regrow and they do so at a rate of 1mm every day. This means that the higher up your arm your injury is, the longer it takes for the nerve to regrow back to the muscles and the skin of the hand.

What can I do to help my recovery?

There is nothing we can do to speed up the healing of the nerve, but there are things you can do to help your recovery.

- 1) Adopt healthy habits. Nerves are small and the vessels supplying them with blood are even smaller, so it will likely help your recovery if you stop smoking and eat healthily. If you smoke, the best way of stopping is with a combination of specialist support and medication. If you would like to be referred to a smoking cessation service then please ask your therapist or GP to refer you, or you can self-refer through the NHS website.
- 2) Your therapist will give you exercises to help with your recovery. It is beneficial to do these regularly. The body is very clever at adapting and “cheating” by using stronger non-affected muscles during your day-to-day activities. It is important to set time aside every day to really focus on the recovery of the weaker or paralysed muscles and the recovery of sensation. You may also be given a splint to hold the weak joints and/ or help your nerve function.
- 3) If the nerve has been repaired with surgery, you will often have to wear a splint to protect the repair in the first month afterwards. You must wear the splint as instructed because nerve repairs are very delicate and they can easily be damaged.

What to expect while your nerve is recovering

In the early stages of nerve recovery your hand or area of skin affected by your injury may feel completely numb. This may change to tingling or pins and needles, or a burning sensation. This may be painful and uncomfortable, but it is a sign that your nerve is beginning to recover.

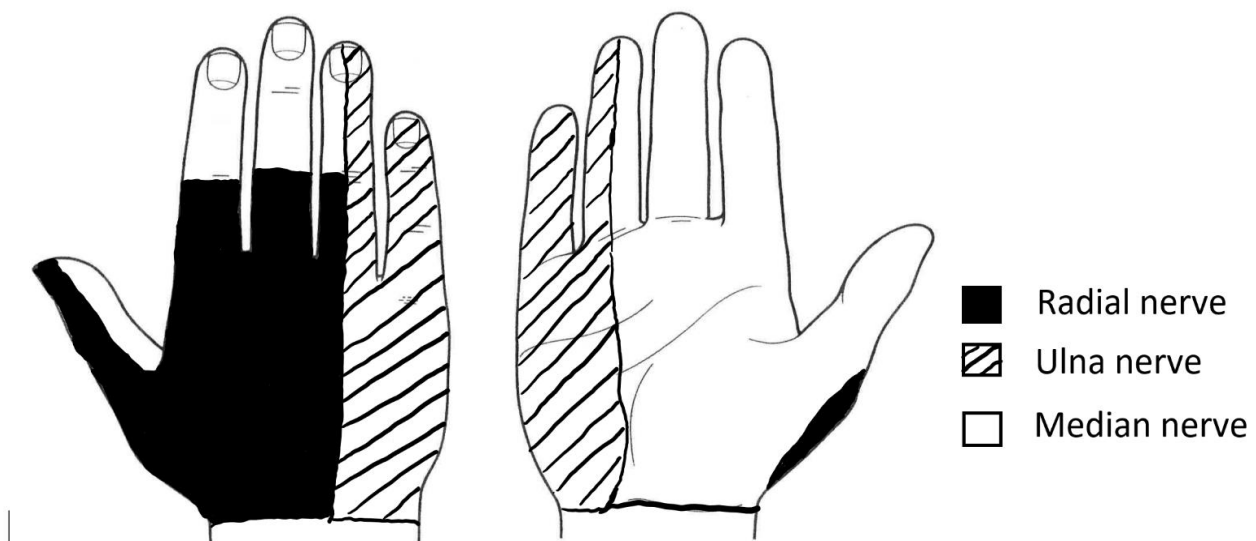
Some muscles may not work immediately after your injury and when they do start to work again, they may be very weak and take time to strengthen. You may also notice some areas of muscle wasting (atrophy) in your hand and your hand may rest in a certain position because of the changes to your muscles.

The skin on your hands may become dry as the skin that has no nerve supply loses normal sweating. Your fingertips may feel ‘slippery’, making it difficult to pick up small items. You may also notice the area of skin on your hands that does not have sensation looks red or mottled and your nails are ridged and brittle.

The following table shows some of the possible effects on your movements and feeling in your arm/hand from each nerve injury. This will vary according to the level of your damaged nerve.

Nerve injured	Area of numbness/ altered feeling	Movements lost	Likely effect
Radial	Back of the arm, forearm and hand (thumb, index and middle fingers)	Lifting the wrist, fingers and thumb upwards	A 'dropped wrist' – this is where your wrist sits in a bent position and you cannot use your muscles to lift it up. The muscles on the back of the forearm was become visibly smaller (muscle wasting)
Ulnar	Front and back of the little finger and half of the ring finger (side closest to little finger)	Spreading the fingers apart and bringing them in back together	Clawing of the little and ring fingers Wasting of the muscles between the bones in the hand
Median	Front of the thumb, index, middle and half of the ring finger (side closest to the middle finger)	Moving your thumb away from your palm Difficulty touching the tips of your fingers with the tip of your thumb	Flattening of the muscles at the base of your thumb

Areas of numbness/ altered feeling from each nerve injury:



Rehabilitation following your nerve injury

The main goals of your treatment in hand therapy are the following:

- 1) **To keep your joints supple while you are waiting for your muscles to recover.** Your therapist will usually show you exercises that involve using your other hand to stretch your affected joints.
- 2) **To speed up your sensory and motor recovery.** Although we can't speed up the nerve healing, we can speed up the motor and sensory recovery. This can be split into two phases.

The first phase is when there is no or little motor and sensory recovery. Your therapist will give you some tricks to help you to imagine movement and sensation to trick your brain into thinking the information is still getting through. We know that this part of the rehabilitation is the most difficult to understand but it can really help your motor and sensory recovery.

The second phase of the rehabilitation is when your movement and sensation are starting to recover. Your therapist will give you specific exercises to help the weak muscles to grow stronger, and for your sensation to be stronger and more accurate.

- 3) **To compensate for the lack of function whilst the nerve is recovering.** There are several types of splints that are designed to hold your joints or replace movement during recovery. Your therapist will help you choose a type of splint that suits your condition and your lifestyle. During your recovery you may require different splints, your therapist will discuss this with you. If you are given a splint, it is important to check your skin regularly for red or sore areas, particularly in areas where you cannot feel the skin. Contact your therapist if you have any concerns or if your splint is uncomfortable.

Caring for your hand after your nerve injury

Without sensation in your hand, you are at risk of injury by burning, pressure or friction. You will initially lose the normal warning signs of pain that alert you to injury. The loss of sweating in the hand can also increase your risk of skin burns because sweating is the skin's way of cooling itself. Therefore, you must be extra cautious with your hand when coming in to contact with hot surfaces and even everyday activities which were not harmful before your injury, especially when cooking or if you smoke. You should regularly check your skin condition and monitor for signs of redness or blistering. Regularly moisturising can help dry skin. If you are going out in the sun, use sun cream (factor 50 plus) to avoid burning.

Useful contact details

To reschedule an appointment:

- 1) Phone : 020 3311 0333
Option 1: If your appointment is on the same day.
Option 2: If your appointment is another date in the future.
- 2) Email : appointments@imperial.nhs.uk

To contact a therapist : imperial.handtherapyimperial@nhs.net

How do I make a comment about my visit?

We aim to provide the best possible service and staff will be happy to answer any of the questions you may have. If you have any **suggestions** or **comments** about your visit, please either speak to a member of staff or contact the patient advice and liaison service (**PALS**) on **020 3313 0088** (Charing Cross, Hammersmith and Queen Charlotte's & Chelsea hospitals), or **020 3312 7777** (St Mary's and Western Eye hospitals). You can also email PALS at imperial.pals@nhs.net The PALS team will listen to your concerns, suggestions or queries and is often able to help solve problems on your behalf.

Alternatively, you may wish to complain by contacting our complaints department:

Complaints department, fourth floor, Salton House, St Mary's Hospital, Praed Street
London W2 1NY

Email: ICHC-tr.Complaints@nhs.net

Telephone: **020 3312 1337 / 1349**

Alternative formats

This leaflet can be provided on request in large print or easy read, as a sound recording, in Braille or in alternative languages. Please email the communications team:
imperial.communications@nhs.net

Wi-fi is available at our Trust. For more information visit our website: www.imperial.nhs.uk

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