
Hand therapy department

Peripheral nerve repair in the hand and arm

Information for patients following surgery

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

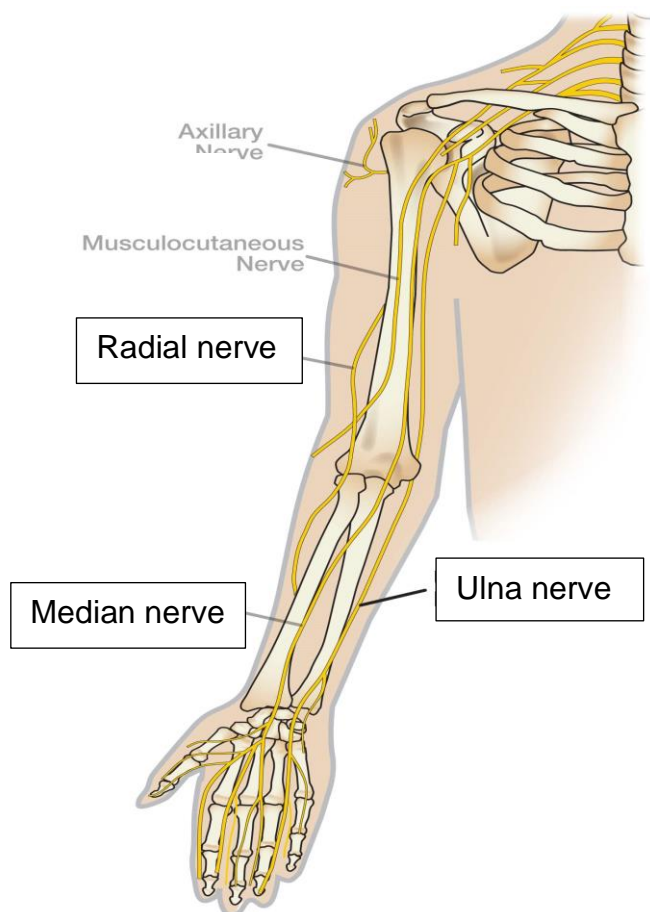


Diagram adapted from the American Society for Surgery of the Hand

Your injury and surgery

Your nerve has been repaired by lining up the ends of the damaged nerve and sewing them together. After the repair, 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.

As a result, there will initially a complete loss of movement of the affected muscles and complete loss of feeling in some areas of your arm/hand. The pattern of this will depend on which nerve you have damaged and where along the length of the nerve the damage has occurred.

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. After approximately six weeks you may then start to feel tingling or pins and needles, or a burning feeling. Whilst this may be painful and uncomfortable, it is a sign that your nerve is beginning to recover.

The muscles supplied by your damaged nerve will not work immediately after surgery and when your muscles do start to work again, they will be very weak and will take time to strengthen.

You may 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.

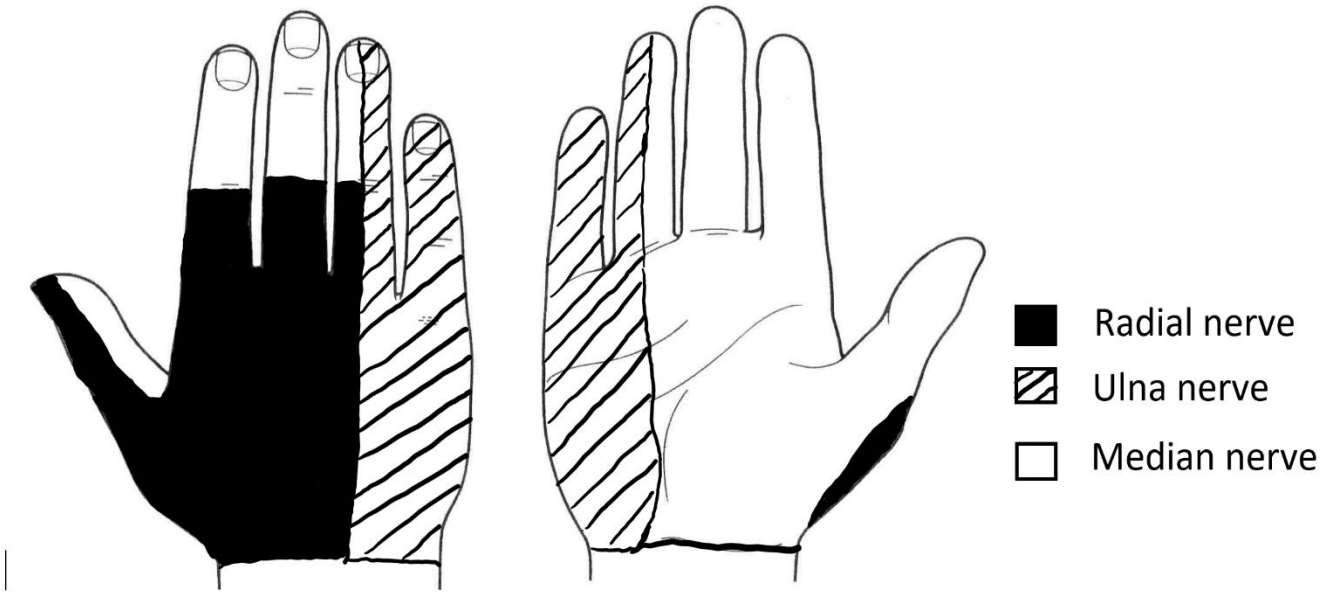
The skin on your hands may become dry as skin that has no nerve supply loses normal sweating and your fingertips may feel 'slippery' making it difficult to pick up small items. You may also notice the region of skin on your hands which does not have sensation, may look red or mottled and your nails can become 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 repaired	Area of numbness/ altered feeling	Movements lost	Hand posture / muscle wasting
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
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Areas of numbness/ altered feeling from each nerve injury:



Wound care

After discharge from hospital, you will have an out-patient appointment in the Plastics Dressings Clinic. The surgical dressing will be removed, your wound checked and cleaned, and a new dressing applied.

- It is beneficial to keep your wound clean and dry to prevent the risk of infection.
- If you have been prescribed antibiotics, make sure you complete the course.
- Smoking is associated with a delay in wound and nerve healing therefore consider reducing the amount you smoke or stop altogether. 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.
- Signs of wound infection include swelling, expanding redness and pain in the affected area, pus forming in or around the wound or feeling generally unwell with a high temperature (fever).
- If you suspect a wound infection go straight to A&E as you may need antibiotics.

Swelling management

- It is important to try and minimise swelling after surgery, as this can cause stiffness in your hand. Try to keep your hand lifted to your shoulder, above the level of your heart. This is particularly important during the first few weeks after your surgery.
- When sitting or lying use pillows to support your arm, especially when sleeping.
- When you are outdoors support your arm in a sling or use your arm muscles to hold your arm across your chest towards your opposite shoulder.

Hand therapy and rehabilitation following your nerve repair

The hand therapy team will guide you through your recovery following your operation. The therapy for your injury will also take into consideration any other injuries you may have sustained at the same time such as injury to the tendons, ligaments, joints and bones.

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

- 1) **Adopt healthier habits.** Nerves are small and the vessels supplying them with blood even smaller, so it is usually recommended that you stop smoking and try to eat healthily.
- 2) Your therapist will give you **exercises** to help with your recovery. It is important to perform these regularly. 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 the sensation.

On your first appointment your therapist will remove the plaster of Paris that was applied after your operation and may replace this with a lighter custom-made plastic splint which will be moulded to your arm/hand. The splint will help to prevent movements and activity that will risk damaging your nerve repair. You may require protection in this splint for up to 4 weeks.

Splint

- This must be worn **FULL TIME** until advised by your hand therapist. This includes during the night and when showering or in the bath.
- Do not place your splint near anything hot as this will affect its shape/fit and result in the splint becoming uncomfortable.
- Check your skin regularly for red or sore areas, particularly in areas where you cannot feel the skin. Use a safe technique shown to you by your therapist. Contact your therapist if you have any concerns or if your splint is uncomfortable.
- Use a plastic bag over the whole of your arm when in the bath or shower (please do not remove your splint)

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.

Scar massage

You can start scar massage when your stitches have been removed and your wound looks dry

- Use a simple moisturiser, e.g. aqueous cream or E45, over your scar.
- Rub over your scar to encourage the skin to move normally.
- You can also do some massage without moisturiser.
- Perform this 3-4 times per day for approximately 5 minutes. You may notice some tingling or shooting sensations when you are applying pressure on the area of skin above your nerve repair, but this is normal and safe to continue the massage.

Caring for your hand after your nerve repair

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.

Cold intolerance

Cold intolerance is experiencing an overly strong reaction to a cold environment or cold surface. Cold intolerance is common after nerve injury and can cause pain, discomfort, stiffness, tingling and changes in skin colour. This can occur for example when handling cold objects or with a change of temperature. This can occur soon after injury in some people but in others can occur many months after. It is difficult to predict how long this will last as it is variable from person to person. Smoking can exacerbate this as it reduces blood supply to your hand.

What can help cold intolerance?

- Keeping your body warm. Wear plenty of layers including body warmers or thermal vests.
- Keeping your hand warm- thermal insulating gloves, heat pads (although be cautious not to burn your hand)
- Stop smoking as this reduces the blood supply to your hand and can make cold intolerance worse

Can I expect a full recovery from a nerve injury?

The recovery of any nerve repair is difficult to predict. The length of time depends on your age, the injury, your health and your participation in your rehabilitation. Information on the severity and level of injury as well as the speed of your recovery will help your therapist to give you more information on your expected recovery.

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

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

Hand therapy department
Published: December 2023
Review date: December 2026
Reference no: 808
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