

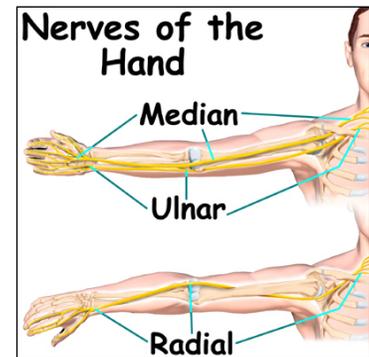
# Nerve injuries – late phase

## sensory re-education

### Introduction

The nerves make the muscles work by sending messages from the brain telling them to contract. The nerves allow us to feel sensations such as light or firm touch, hot or cold, by sending messages to the brain. They also tell us the position of the arm.

Following minor injuries, nerves may be bruised and therefore some sensation and function may be lost. As the bruising settles the muscles and sensation will return to normal. This often takes several weeks.



Following more significant injuries some or all of the nerves may be damaged or cut and the part furthest from the body may even die. The nerve will start to regenerate (grow again) after three to four weeks. Depending upon the amount of damage and the health of the soft tissues, the muscles and sensation start to recover. It is not possible to predict if the recovery will be complete.

### How this affects you

If your sensation is reduced you need to be careful with hot temperatures and sharp objects. For example, if your hand is left over a boiling saucepan your nerve will not inform you to move your hand away and it may get burnt. Or if you accidentally cut yourself your nerves will not register pain, and the cut may be worse. If your muscles are weak or don't work you may lose function or get joint stiffness. Once the joints are stiff it can be very difficult to get the movement back, and the hand may not recover.

### Treatment

There are many different treatments available. Nerves that have been cut can be repaired surgically if discovered quickly. Alternatively nerves can be injured without being cut, and they may recovery over time with hand therapy, or the injury may be permanent. Such permanent injuries can be treated by moving nerves or tendons that supply unaffected muscles, to restore one function by sacrificing another – these are known as nerve transfers or tendon transfers. Another surgical option is to stop joints moving permanently and position bones better to avoid a contracture or deformity – this is known as a fusion. Regardless of treatment used, hand therapy is crucial.

## Hand therapy

Therapy can measure how much you can feel, and educate you on your specific risks. We can monitor your improvement and, if necessary, re-educate your sense of touch as your nerves re-grow. We can make splints to improve your movement and prevent stiffness. We can teach you exercises to prevent stiffness and help mobility.

What can you do?

- Eat a healthy balanced diet to help the nerve recover and keep the soft tissues healthy.
- Ensure you do your recommended exercises. Any stiffness will reduce the use of your hand.
- Wear your splints as advised.
- Remember to be careful with sharp or hot objects.

## Radial nerve injury

The radial nerve straightens the elbow and lifts the wrists and fingers. It mainly supplies the sensation to the back of the hand. If these muscles do not work you will be supplied with a resting splint, for comfort and to stop the tendons stretching. You may be given a splint to improve the use of your hand.



## Ulna nerve injury

The ulnar nerve helps with making a fist. It gives power and smooth movement of the ring and little fingers. It supplies sensation to the palm side of the little finger and half of the ring finger. If these muscles don't work you may need a resting splint to stop the joints getting stiff and a splint to stop the fingers clawing or curling as you straighten them.



## Median nerve injury

The median nerve mainly controls the thumb placement. It supplies the sensation to the palm side of the thumb, index and middle fingers and half of the ring finger. If these muscles do not work you may need a splint to hold your thumb in a better functional position, as the muscles cannot do it. The picture above shows the thumb at the side of the hand, the muscles are unable to bring it into a useful position.

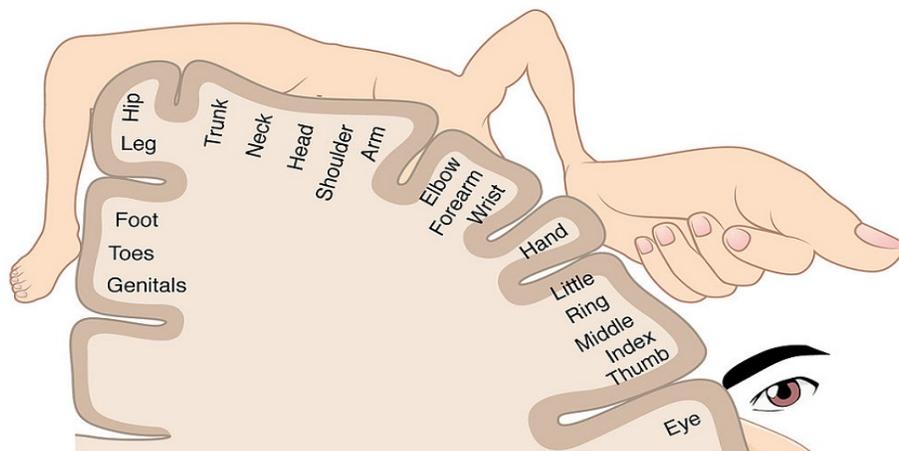


## Sensory Re-education

This is a way to help you to recover from your nerve injury. After a nerve injury you lose both feeling and muscle function. It is important to start these re-training exercises even before you have any obvious signs of recovery. The exercises involve the need to think about what you are feeling and seeing in your injured hand, as compared to your uninjured hand.

After a nerve injury in the hand, wrist or arm, there is a loss of feeling (sensation) in the area of the limb that the nerve used to supply. The nerve fibres regrow at approximately 1mm a day. However, once the nerve has regrown, it still takes time for the sensation to return. The recovery of normal sensation is not guaranteed and is affected by many factors such as your age and the severity of the injury. Sensory re-education techniques help to give the nerve the best chance of recovery.

Recovery of feeling in the hand involves both the nerves in the affected limb and the brain. The brain receives the sensation from the hand and processes these inputs in a dedicated area of the brain. As a new nerve fibres grows, the brain has to learn to communicate with the new nerve and re-programme the sensations.



*the sensory homunculus – a 'hand and body map' inside the brain*

## Exercises

The exercises are best performed little and often. They take patience, motivation and need regular practice and repetition. Even though the hand may be numb or have abnormal sensation such as tingling, try to use your hand as normally as possible despite the loss of feeling. However, please ensure that your hand is safe and take care with sharp or hot objects. If possible, it may help to do exercises where other senses can also be used such as smell, sound and taste. Using other senses that are working normally will help to improve the re-learning process.

## Early Phase Training & Rehabilitation

During this time, you may have minimal feeling in the hand. It is important to carefully watch the hand when you use it to prevent injury (e.g. burns). During this phase it is important to regain any movement that has been lost and your therapist will provide you with appropriate exercises to stop joints getting stiff and muscles becoming tight. The sensory re-education in this early phase is aimed at stimulating the part of the brain supplied by the nerve(s) you have damaged.

- When doing everyday tasks use touch, taste vision and smell. For example when peeling an orange, take the time to look at it and smell it.



- Watch someone else touch things and think about how that touch normally feels.
- Touch the areas of the hand that you cannot feel. Concentrate on what you are touching. Think about what it would normally feel like. This helps to activate the specific area of your brain supplied by the nerve you have damaged.



- You can ask someone else to touch the part of the hand with no sensation and the same part on your other hand at the same time while you watch carefully. Think about the sensation in the unaffected hand.



## PATIENT INFORMATION LEAFLET

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### Further information

The day surgery unit can be contacted on 02476 966861 / 02476 966868 (University Hospital), or on 01788 663264 (Hospital of St. Cross). For further information please visit our hand service's web site at [www.tinyurl.com/uhcwhand](http://www.tinyurl.com/uhcwhand), or contact:

- Hand Therapy at University Hospital Coventry & Warwickshire on 02476 966016
- Hand Therapy at Hospital of St. Cross, Rugby on 01788 663257
- Our specialist hand surgery nurse / hand-coordinator on 02476 965072

The Trust has access to interpreting and translation services. If you need this information in another language or format please contact 02476 966861 and we will do our best to meet your needs.

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