

## Risks associated with your anaesthetic

# SECTION 12: NERVE DAMAGE ASSOCIATED WITH PERIPHERAL NERVE BLOCK

Your anaesthetist may suggest that you have a peripheral nerve block. This is an injection placed near to a nerve or group of nerves. Rarely, this injection can damage nerves. This article gives you information as follows:

- ▶ What is a peripheral nerve block?
- ▶ How can nerve damage happen?
- ▶ How does it feel to have nerve damage?
- ▶ What recovery can I expect?
- ▶ How does nerve damage happen?
- ▶ If I think I have nerve damage, what can be done about it?
- ▶ How likely is permanent nerve damage?

### What is a peripheral nerve block?

This is an injection of local anaesthetic near to the nerves which go to the area of your operation. It makes the area feel numb. The injection is used with or without a general anaesthetic.

- ▶ If a general anaesthetic is given, the nerve block is intended to help with pain relief afterwards.
- ▶ If there is no general anaesthetic, the nerve block is intended to make you numb enough to have the operation without feeling anything. It can only be done like this if there is a nerve block suitable for your operation. It is useful if you wish to avoid a general anaesthetic. Sedation medicines may be given to keep you calm and relaxed.

You can find out more about these choices in the booklet *Anaesthesia Explained* which you will find on the Royal College of Anaesthetists' website ([www.rcoa.ac.uk](http://www.rcoa.ac.uk)).

### Types of nerve block

There are many types of nerve block, each one aimed at a different group of nerves.

Your anaesthetist will tell you if there is a block suitable for your operation. He or she will discuss the benefits, the risks and your preferences. Then you can decide whether you would like a nerve block.

### How long does the block last?

A nerve block can give pain relief for between two and 18 hours depending on the site and on the drugs used. Sometimes a catheter (a very thin tube) can be passed through the needle and left in place, near the nerve. Local anaesthetic can then be injected through the catheter for a longer period – perhaps up to a few days.

## Risks and benefits

A nerve block is intended to reduce the need for other anaesthetic drugs or to avoid a general anaesthetic altogether. It should also give you better pain relief after your operation. This allows you to be mobile more quickly after your operation. You may not need as much strong pain-relieving medicine, such as morphine. This will help reduce the side effects associated with these medicines, which include nausea (feeling sick) and drowsiness. These benefits may lead to a reduced stay in hospital.

The risks of having a nerve block include damage to the nerves. This is the subject of this leaflet. You can find out about the other risks by asking your anaesthetist.

## How can nerve damage happen?

Nerve damage after peripheral nerve block is usually temporary and most patients make a full recovery within a few days or weeks.<sup>1,2</sup> However, rarely, nerve damage is permanent.

## How does it feel to have nerve damage?

Some people have mild changes in sensation (feeling). There may be an area of numbness or 'pins and needles'. Some patients describe strange sensations or pain in the area affected. Uncommonly, there may be weakness in one or more muscles.

## What recovery can I expect?

Most nerve injuries are temporary, and will recover over a period of about three months. Permanent injury occurs on rare occasions. However if serious nerve damage happens, there can be severe pain or permanent paralysis of the area involved.

## How does nerve damage happen? What is done to prevent nerve damage?

The ways in which a nerve can be damaged are listed here, and explained below. Anaesthetists who perform nerve blocks are trained in the technique and will take steps to prevent these types of nerve damage:

- ▶ direct injury caused by the needle or the catheter
- ▶ toxic effects on the nerves caused by the drugs injected
- ▶ haematoma (a blood clot)
- ▶ inadequate blood supply
- ▶ infection
- ▶ other causes.

### Direct injury

This happens if the needle or catheter damages the nerve. During some nerve blocks, the needle or catheter may touch a nerve, causing 'pins and needles' or a brief shooting pain. This does not mean the nerve is necessarily damaged, although your anaesthetist should reposition the needle or catheter with care, so that damage does not occur.

If you are having a peripheral nerve block and a general anaesthetic, your anaesthetist may wish to do the nerve block while you are awake, before giving the general anaesthetic. This allows you to report any tingling or shooting pains that you feel. If you notice these, you should tell the anaesthetist immediately. The anaesthetist will reposition the needle and the feelings should disappear.

If you have the nerve block after you are anaesthetised, the anaesthetist will take other precautions to avoid nerve damage.

To help position the needle correctly, the anaesthetist may use an ultrasound machine which gives a picture of the nerve, the needle and the surrounding structures. This helps find the correct place for the injection. It may improve the success rate of the nerve block and may reduce the risk of nerve damage from the injection.

### **Toxic effects**

The drugs injected can very rarely cause a chemical irritation that damages the nerves. The drugs used are chosen for their very low risk of causing this problem.

### **Haematoma (a blood clot)**

This happens when there is bleeding near the nerve due to damage to a blood vessel by the needle or catheter. Small amounts of bleeding or bruising are common, and do not cause damage to nerves. A large collection of blood is called a haematoma, and this may press on a nerve and cause damage. Rarely, an urgent operation is required to remove the haematoma and stop it pressing on the nerve.

If you take blood-thinning medicines such as warfarin or clopidogrel, you are more likely to get a haematoma. Your anaesthetist will take this into account before he/she offers you a nerve block. You will be asked about which drugs you take at the pre-assessment clinic. It helps if you take all your medicines when you attend that clinic, to make sure the list is correct.

### **Inadequate blood supply**

Every nerve is supplied by blood vessels, which keep it healthy. If the blood supply to a nerve is damaged by the needle or catheter, the nerve suffers a lack of oxygen, which can damage the nerve.

### **Infections**

Infection after peripheral nerve block is very rare. This is because anaesthetists take care to work in very clean or sterile conditions. Infection is slightly more likely if a catheter is left in place but the risk is still very small. Catheter entry points should be kept clean and checked regularly. If you have infection elsewhere or a weak immune system, you are more likely to get an infection. The anaesthetist will take this into account before he/she offers you a nerve block.

### **Other causes of nerve damage**

If you have nerve damage, you should not assume that it is caused by the nerve block. The following list shows other causes of nerve damage during an operation. You can find out more about these causes in Section 10 in this series of articles.

- ▶ The surgeon may damage your nerves. During some operations, this may be difficult or impossible to avoid. If this is the case, your surgeon should discuss it with you beforehand.
- ▶ The position that you are placed in for the operation can stretch a nerve and damage it.
- ▶ The use of a tourniquet (a tight bandage) to reduce bleeding during the operation will press on the nerve and may damage it.
- ▶ Swelling in the area after the operation can damage nerves. If it is a limb, elevation of the limb will help reduce any swelling.
- ▶ Pre-existing medical conditions, such as diabetes or atherosclerosis (narrowing of your blood vessels), can make damage more likely.

### **If I think I have nerve damage, what can be done about it?**

If you experience numbness lasting longer than 48 hours or any of the symptoms mentioned above, you should contact the hospital where you had the procedure. Your anaesthetist or surgeon may arrange for you to see a neurologist (a doctor specialising in nerve diseases). Tests may be done to try and find out exactly where and how the damage has occurred. These tests may be:

- ▶ Nerve conduction studies. Very small electrical currents are applied to the skin and recordings are made further up the nerve. This shows whether the nerve is working or not.
- ▶ Magnetic Resonance Imaging (MRI).
- ▶ Computed Tomography (CT) scanning.

The neurologist or the surgeon and/or the anaesthetist will suggest a treatment plan, which might include physiotherapy and exercise. If you have pain, drugs that relieve pain will be used. Drugs which are normally used for treating epilepsy or depression are used because of the way that they change electrical activity in nerves. Drug treatment is not always successful in relieving pain. Occasionally an operation may be recommended, either to repair a nerve or to relieve pressure on a stretched nerve.

### **How likely is permanent nerve damage?**

There have been many studies looking at how often nerve damage happens in various peripheral nerve blocks.<sup>1-7</sup>

Short-term nerve damage (longer than 48 hours) occurs in less than 1 in 10 nerve blocks.<sup>5</sup> The risk varies between the different blocks. The vast majority of those affected (92–97%), recover within four to six weeks. 99% of these people have recovered within a year.

Permanent nerve damage is rare and precise numbers are not available. An estimate from the information that we have suggests it happens in between 1 in 2,000 and 1 in 5,000 nerve blocks.<sup>5,6</sup>

#### **Summary**

Permanent nerve damage after a peripheral nerve block is very rare. Temporary nerve damage is common and it recovers within a few days or weeks.

**Revised in 2013 by:**

**Dr Rachel Croft**, FRCA  
Specialist Registrar  
North West Deanery

**Dr Justin Turner**, FRCA, FFPMRCA  
Lead Consultant for Pain Services  
Salford Royal Foundation Trust

**Editor**

**Dr Barrie Fischer**, FRCA  
Consultant Anaesthetist  
Alexandra Hospital, Redditch  
President, European Society of Regional  
Anaesthesia (GB&I zone) and ESRA Board  
Member 1997–2004

**References**

1. Fischer B. Complications of Regional Anaesthesia. *Anaesth Intens Care Med* 2004;**4**:125–128.
2. Auroy Y et al. Serious complications related to regional anaesthesia. *Anesthesiology* 1997;**87**:479–486.
3. Brull R et al. Neurological complications after regional anaesthesia: contemporary estimates of risk. *Anesth Analg* 2007;**104**(4):965–974.
4. Neal JM et al. ASRA Practice advisory on neurologic complications in regional anaesthesia and pain medicine. *Reg Anesth Pain Med* 2008;**33**(5):404–415.
5. Barrington M et al. Preliminary Results of the Australasian Regional Anaesthesia Collaboration. A Prospective Audit of More Than 7000 Peripheral Nerve and Plexus Blocks for Neurologic and Other Complications. *Reg Anesth Pain Med* 2009;**34**:534–541.
6. Jeng CL et al. Complications of peripheral nerve blocks. *Br J Anaesth* 2010;**105**(S1):97–107.



**The Royal College of  
Anaesthetists**

**The Royal College of Anaesthetists**

Revised edition 2013

The material from this article may be copied for the purpose of producing information materials for patients. Please quote the RCoA as the source of the information. If you wish to use part of the article in another publication, suitable acknowledgement must be given and the RCoA logo must be removed. For more information or enquiries about the use of this leaflet please contact:

The Royal College of Anaesthetists  
website: [www.rcoa.ac.uk](http://www.rcoa.ac.uk)  
email: [clinicalquality@rcoa.ac.uk](mailto:clinicalquality@rcoa.ac.uk)

**This leaflet will be reviewed three years from the date of publication.**