

Risks associated with your anaesthetic

## Section 12: Nerve damage associated with peripheral nerve block

**Y**our anaesthetist may suggest that you have a peripheral nerve block. This is an injection placed near to a nerve or group of nerves. Rarely, there may be damage to nerves. This section gives you information about:

- ▶ what a peripheral nerve block is
- ▶ how likely this is
- ▶ how nerve damage can happen
- ▶ what recovery can be expected.
- ▶ what the symptoms are

A peripheral nerve block is not the same as an epidural or spinal injection, which are described in Section 11.

### 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, making the area feel numb. It may be used on its own, as the sole anaesthetic, or you may receive sedation or a general anaesthetic as well. 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 different groups of nerves. Your anaesthetist will tell you if there is a block suitable for your operation. Having talked about the benefits, risks and your preferences, you can decide together whether you would like a nerve block.

### How long does the block last?

A nerve block can give pain relief for two to 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. More local anaesthetic can then be given for a longer period – perhaps up to a few days.

### Risks and benefits

Benefits of a nerve block may include a shorter recovery period, and better pain relief after your operation. This allows you to be mobile more quickly after your operation. You may not need as many strong pain relieving medicines such as morphine. This will help reduce your risk of the side effects associated with these medicines, which include nausea (feeling sick) and drowsiness.

This article describes nerve damage after a peripheral nerve block. Your anaesthetist will be able to tell you about other risks.

### Nerve damage

Permanent nerve damage is a rare complication of peripheral nerve block.<sup>1-4</sup> Nerve damage is usually temporary, and most patients with nerve damage make a full recovery after a few days or weeks.

### How does it feel to have nerve damage? What recovery can I expect?

Some people have mild changes in sensation (feeling). There may be an area of numbness or 'pins and needles'.

Sometimes there may be strange sensations or there may be pain. Uncommonly, there may be weakness in one or more muscles.

Most nerve injuries are temporary, and will recover over a period of about three months. Permanent injury does occur on rare occasions. In the most serious cases 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.

- ▶ Direct injury caused by the needle or the catheter.
- ▶ Haematoma (a blood clot).
- ▶ Inadequate blood supply.
- ▶ Infection.
- ▶ Other causes.

All anaesthetists performing nerve blocks are trained in the technique and will take steps to prevent these types of nerve damage.

#### **Direct injury**

This may happen if the needle or catheter damages the nerve. Contact with the nerve may cause 'pins and needles' or a brief shooting pain. This does not mean the nerve is damaged but if the needle is not repositioned damage can 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. He/she will be able to explain these to you.

Intra-neural injection (injecting drugs directly into the nerve rather than very near to the nerve) can also cause nerve damage. This would cause feelings similar to those described above. The anaesthetist may use a nerve stimulator (a small electrical gadget which is connected to a sticky pad on your skin and to the needle) to help find the correct spot for injection and to help avoid intra-neural injection.

#### **Haematoma**

This is a collection of blood near the nerve due to damage to a blood vessel by the needle or the catheter. Small amounts of bleeding or bruising are common, and do not cause damage to nerves. A large haematoma 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.

#### **Inadequate blood supply**

Every nerve is supplied by blood vessels, which keep it healthy. If the blood supply is damaged or reduced, the nerve may be starved of oxygen, which leads to damage.

#### **Infections**

These are very rare. They are slightly more likely if a catheter is left in place. Sterile conditions similar to those used for the operation itself are used to help prevent infection. If a catheter is used

the site should be kept clean and checked regularly by a nurse. 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.

### What else can cause 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 related to having an operation. You can find out more about these causes in Section 10 in this series.

- ▶ Your nerves can be damaged by the surgeon. 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 to reduce blood loss during the operation will press on the nerve and may damage it.
- ▶ Swelling in the area after the operation can damage nerves.
- ▶ 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?

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. This might involve:

- ▶ nerve conduction studies (very small electrical currents are applied to the skin or muscles and recordings made

further up the nerve. This shows whether the nerve is working or not)

- ▶ Magnetic Resonance Imaging (MRI)
- ▶ Computed Tomography (CT) scanning.

The neurologist will suggest a treatment plan, which might include physiotherapy and exercise. If you have pain, drugs that relieve pain will be used. This may include drugs that are normally used for treating epilepsy or depression because of the way that they change electrical activity in nerves. Drug treatment is not always successful in relieving pain. Occasionally an operation can be done, 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>1-4</sup>

- ▶ Symptoms lasting more than one week happen in between 1 and 5 out of every 100 nerve blocks (1–5%). 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. A possible estimate from the information that we do have suggests it might happen in between 1 in 5,000 and 1 in 30,000 nerve blocks.

### Summary

Permanent nerve damage after a peripheral nerve block is rare. The most common type of nerve damage causes an area of numb skin which is very likely to resolve within a few weeks.

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### References

- 1 Liguori GA. Complications of regional anesthesia. *Journal of Neurosurgical Anesthesiology* 2004;**16**:84–86.
- 2 Ben-David B. Complications of peripheral nerve blockade. *Anesthesiology Clinics of North America* 2002;**20**:457–469.
- 3 Fischer B. Complications of Regional Anaesthesia. *Anaesthesia and Intensive Care Medicine* 2004;**4**:125–128.
- 4 Auroy Y et al. Serious complications related to regional anesthesia. *Anesthesiology* 1997;**87**:479–486.



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