

Risks associated with your anaesthetic

Section 13: Nerve damage associated with peripheral nerve block

Summary

Your anaesthetist may suggest that you have a peripheral nerve block. This is an injection placed near to a nerve or group of nerves to numb an area of your body. Rarely, this injection can damage nerves.

This leaflet explains how can nerve damage happen, what it feels like to have nerve damage and what can be done about it. Temporary nerve damage is common and it recovers within a few days or weeks. Permanent nerve damage after a peripheral nerve block is rare.

What is a peripheral nerve block?

This is an injection of local anaesthetic near to the nerves that 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 pain. 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 College website:

rcoa.ac.uk/documents/anaesthesia-explained





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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.^{1,2} 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.



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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.



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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 that 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 11 of this series.

- 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



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- 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 may be 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.^{1,2,3,4,5,6}

Short-term nerve damage (longer than 48 hours) occurs in fewer than 1 in 10 nerve blocks.⁵ 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.^{5,6}

References

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- 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.

Further information

Anaesthetists are doctors with specialist training who:

- discuss the type or types of anaesthetic that are suitable for your operation. If there are choices available, your anaesthetist will help you choose what is best for you
- discuss the risks of anaesthesia with you
- agree a plan with you for your anaesthetic and pain control
- are responsible for giving your anaesthetic and for your wellbeing and safety throughout your surgery



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- manage any blood transfusions you may need
- plan your care, if needed, in the intensive care unit
- make your experience as calm and pain free as possible.

Common terms

General anaesthesia – This is a state of controlled unconsciousness during which you feel nothing and may be described as ‘anaesthetised’.

Regional anaesthesia – This involves an injection of local anaesthetic which makes part of your body numb. You stay conscious or maybe sedated, but free from pain in that part of your body.

You can find out more about general and regional anaesthesia in the patient information booklet *Anaesthesia explained*, which is available from the College website via:

rcoa.ac.uk/documents/anaesthesia-explained

Risks and probability

In modern anaesthesia, serious problems are uncommon. Risk cannot be removed completely, but modern drugs, equipment and training have made anaesthesia a much safer procedure in recent years.

The way you feel about a risk is very personal to you, and depends on your personality, your own experiences and often your family and cultural background. You may be a ‘risk taker’, a ‘risk avoider’, or somewhere in between. You may know someone who has had a risk happen to them, even though that is very unusual. Or you may have read in the newspapers about a risk and be especially worried about it.

People vary in how they interpret words and numbers. This scale is provided to help.



Your anaesthetist will give you more information about any of the risks specific to you and the precautions taken to avoid them. There are some rare risks in anaesthesia that your anaesthetist may not normally discuss routinely unless they believe you are at higher risk. These have not been listed in this leaflet.

You can find more information leaflets on the College website: rcoa.ac.uk/patientinfo



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This leaflet has been reviewed by the RCoA Patient Information Group which consists of patient representatives and experts in different areas of anaesthesia.

Disclaimer

We try very hard to keep the information in this leaflet accurate and up-to-date, but we cannot guarantee this. We don't expect this general information to cover all the questions you might have or to deal with everything that might be important to you. You should discuss your choices and any worries you have with your medical team, using this leaflet as a guide. This leaflet on its own should not be treated as advice. It cannot be used for any commercial or business purpose.

For full details, please see our website: rcoa.ac.uk/patientinfo/resources#disclaimer

Information for healthcare professionals on printing this leaflet

Please consider the visual impairments of patients when printing or photocopying this leaflet. Photocopies of photocopies are discouraged as these tend to be low quality prints and can be very difficult for patients to read. Please also make sure that you use the latest version of this leaflet, which is available on the RCoA website: rcoa.ac.uk/patientinfo/risk-leaflets



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Tell us what you think

We welcome suggestions to improve this leaflet. Please complete this short survey at: surveymonkey.co.uk/r/testrisk. Or by scanning this QR code with your mobile:



If you have any general comments, please email them to: patientinformation@rcoa.ac.uk

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This leaflet will be reviewed within five years of the date of publication.

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