

Risks associated with your anaesthetic

Section 12: Nerve damage associated with a spinal or epidural injection

Summary

This leaflet explains the possibility of nerve damage occurring with your spinal or epidural injection. These injections are usually carried out without any problems and if nerve damage does occur it is usually temporary. Rarely damage may be permanent.

This leaflet explains though what types of nerve damage can happen, what the symptoms are and what can be done to prevent it occurring. Your anaesthetist will be able to tell you about the benefits and risks of an epidural or spinal injection for you as an individual and tell you about the alternatives.

What is a spinal injection?

A very thin needle is inserted between the bones of your back, through ligaments and then into the fluid surrounding the spinal cord. Spinal injections are performed in the lower part of the spine. At this level, the spinal cord itself has ended and a bundle of nerves is present which supplies the legs and genital area. Nerves in this area are surrounded by a liquid called cerebro-spinal fluid (CSF). A single injection of local anaesthetic (sometimes with other painkillers) is given and the needle is removed. This injection should make you feel numb in the lower part of the body for between about two and four hours.

You can find out more about having a spinal injection in the leaflets Anaesthesia explained and Your spinal anaesthetic – both available from rcoa.ac.uk/patientinfo/leaflets-video-resources





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What is an epidural injection?

A larger needle is used to introduce a thin catheter (tube) into your back. The needle is passed between the bones, through ligaments and into a space outside the linings of the spinal cord. The catheter is passed through the hollow needle into this space and the needle is then removed. The catheter is taped securely to your skin. You can lie on your back with this catheter in place. Local anaesthetic and other drugs can be given through this catheter for a period of time – perhaps several days.

An epidural is used for operations which are longer than two hours or when pain relief is needed for several days.

You can find out more about having an epidural in the leaflet Epidural pain relief after surgery which is available from the College website: rcoa.ac.uk/patientinfo/leaflets-video-resources

Risks and benefits

You can find general information about the risks and benefits of spinal and epidural injections in the leaflets named above. Your anaesthetist will be able to tell you more about your individual risks and benefits. He/she will also be able to describe alternative treatments, which will also have benefits and risks.

This article describes nerve damage associated with spinal and epidural injections. It is aimed at patients having all kinds of operations. If you are planning to have an epidural or a spinal for childbirth you can find relevant information at: labourpains.com/home

How do we know about these risks?

We know about the risks of epidurals and spinals from medical audit. A few years ago all the anaesthetists in the country contributed to an audit project that examined this topic in detail.

The project collected reports from anaesthetists of any major problem that had occurred with an epidural or a spinal performed in an NHS hospital in the UK for a period of one year. The project was called the 3rd National Audit Project (NAP3) and you can find further information via the website: nationalauditprojects.org.uk/NAP3_home

What types of nerve damage can happen?

Nerve damage is a rare complication of spinal or epidural injections. Nerve damage is usually temporary. Permanent nerve damage resulting in paralysis (loss of the use of one or more limbs) is very rare. More figures are given at the end of this section.

- A single nerve or a group of nerves may be damaged. Therefore the area affected may be small or large.
- In its mildest form you can get a small numb area or an area of 'pins and needles' on your skin.
- There may be areas of your body that feel strange and painful.



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- Weakness may occur in one or more muscles.
- The most severe (and very rare) cases give permanent paralysis of one or both legs (paraplegia) and/or loss of control of the bowel or bladder.

The majority of people make a full recovery over a period of time between a few days and a few weeks. Permanent damage is very rare.

How does nerve damage happen?

The ways in which nerve damage can be caused by a spinal or epidural injection are listed here and explained below.

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

Direct injury

This can occur if the epidural or spinal needle or the epidural catheter damages a single nerve, a group of nerves or the spinal cord.

Contact with a nerve may cause 'pins and needles' or a brief shooting pain. This does not mean that the nerve is damaged, but if the needle is not repositioned, damage can occur. If this happens you should try to remain still and tell your anaesthetist about it. The anaesthetist will change the position of the needle and the sensations will usually improve immediately.

Most cases of direct damage are to a single nerve and are temporary. Injecting drugs right into the nerve rather than into the area surrounding it can also cause direct damage.

Haematoma (blood clot)

This is a collection of blood near the nerve, which collects 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 the nerve. A large haematoma may press on a nerve or on the spinal cord and cause damage. This is a **very rare** problem, but may require an urgent operation to remove the haematoma and relieve the pressure.

If your blood does not clot normally or you take a blood-thinning medicine such as warfarin, heparin or clopidogrel, you are more likely to get a haematoma. In most circumstances you will be asked to stop these medicines, before you have an epidural or spinal injection. If your blood does not clot for other reasons, e.g. haemophilia, you are also at increased risk of this complication. It is important that you tell your anaesthetist about any problems with blood clotting that you have had in the past as you may not be able to have an epidural or spinal injection. See below for more details about blood thinning medicines.



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Infection

Most infections related to a spinal injection or an epidural are local skin infections and do not cause nerve damage. **Very rarely**, an infection can develop close to the spinal cord and major nerves. There may be an abscess (a collection of pus) or meningitis. These infections are very serious and require urgent treatment with antibiotics and/or surgery to prevent permanent nerve damage.

If you already have a significant infection elsewhere, or if you have a weak immune system, you have a higher risk of these serious infections. You may not be offered an epidural or spinal injection.

Inadequate blood supply

Low blood pressure is very common when you have an epidural or spinal injection. This can reduce the blood flow to nerves and, rarely, this can cause nerve damage. Anaesthetists are aware of this risk and use drugs and intravenous fluid to prevent large drops in blood pressure.

Other causes

There have been cases of the wrong drug being given in an epidural or spinal injection. This is an exceptionally rare event and all anaesthetists take precautions to eliminate this type of error.

What else can cause nerve damage?

If you have nerve damage, it may not well be caused by the epidural or spinal injection. The following list shows other causes of nerve damage related to having an operation. You can find more about these causes in Section 11 in this series.

- Your nerves can be damaged by the surgery. 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. Tourniquets are used for many orthopaedic arm and leg operations.
- Swelling in the area after the operation can damage nerves.
- Pre-existing medical conditions that interfere with blood supply, e.g. diabetes or atherosclerosis – narrowing of your blood vessels, or with nerve function (e.g. multiple sclerosis) can make damage more likely or make it more difficult to determine the cause of complications.



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What is done to prevent nerve damage?

Anaesthetists are trained to be aware of nerve damage. Steps taken to prevent each kind of damage are described here.

Direct injury

- Spinal injections are placed below the expected lower end of the spinal cord. This should prevent damage to the spinal cord itself.
- Spinal injections are usually performed while you are awake or lightly sedated. If there is pain or tingling due to contact with a nerve, you will be able to warn the anaesthetist who will then be able to adjust.
- Your anaesthetist may also wish to do your epidural injection while you are awake. Direct nerve injury after an epidural injection is rare, and there is no clear evidence about whether it is safer to do the epidural while you are awake or after a general anaesthetic has been given.

Haematoma (blood clot)

- If you take an anticoagulant (a drug which thins the blood, such as warfarin), you will be asked to stop it several days before surgery if your doctors think it is safe to do so:
 - the anaesthetist and surgeon together will decide if and when the drug should be stopped
 - for some anticoagulant drugs a blood test will allow your anaesthetist to decide if it is safe to have a spinal or epidural injection
 - there are some newer drugs such as Rivaroxaban (Xarelto) and Apixaban (Eliquis) for which a specific test is usually not available, but the time the drug has been stopped for will allow the anaesthetist to know if it is safe to go ahead
 - if your anticoagulation cannot be safely stopped, then you will not be able to have an epidural or spinal injection.
- If you take clopidogrel (Plavix) (another drug which thins the blood by its effect on platelets), you will usually be asked to stop it several days before planned surgery. For urgent surgery, your doctors will think about whether it is safer for you to have or to avoid a spinal or epidural injection.
- If you take aspirin, you can have an epidural or spinal injection.

Infection

All epidural and spinal injections are performed under 'aseptic conditions', i.e. using special precautions to make the procedure as clean as is possible, similar to those used during the operation. Your back should be kept clean and regularly checked over the next few days.



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General care

If you have an epidural or spinal injection, the nurses will make regular checks until everything returns to normal. This should help spot possible nerve damage very early and if treatment is needed it can be started immediately.

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

If you are concerned you may have nerve damage from an epidural or spinal injection it is important your anaesthetist knows about it. Your anaesthetist will be able to assess you. Your anaesthetist 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): a form of body scan
- Computed Tomography (CT): a form of body scan.

If necessary, 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 is necessary, either to repair a nerve or to relieve pressure on a stretched nerve.

How likely is permanent nerve damage?

The best data available in the UK comes from the NAP3 project described previously in this leaflet. The risk of damage to nerves is low. In many of these people the symptoms improve or resolve within a few weeks or months. The risk of longer lasting problems for all types of spinal and epidural injection is:

- permanent harm 1 in 23,500 to 50,500 spinal or epidural injections
- paraplegia or death 1 in 54,500 to 1 in 141,500 spinal or epidural injections.

These figures are only broad guidelines. The risk may be higher or lower depending on your general health and the circumstances in which you are having the spinal or epidural. Your anaesthetist can give you more specific information.

If you want to read more detailed, technical information you can visit the National Audit Project website: nationalauditprojects.org.uk/NAP3_home



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Further reading

- 1 Horlocker TT et al. Regional anesthesia in the patient receiving antithrombotic or thrombolytic therapy: American Society of Regional Anesthesia and Pain Medicine Evidence-Based Guidelines (Third Edition). *Reg Anesth Pain Med* 2010;**35(1)**:64–101.
- 2 Cook TM, Counsell D, Wildsmith JAW. Major complications of central neuraxial block: report on the Third National Audit Project of the Royal College of Anaesthetists. *Br J Anaesth* 2009;**102**:179–190.
- 3 de Seze MP et al. Severe and long-lasting complications of the nerve root and spinal cord after central neuraxial blockade. *Anesth Analg* 2007;**104**:975–979.
- 4 Regional anaesthesia in patients with abnormalities in coagulation. *AAGBI*, London 2011 (bit.ly/2feyLyn).
- 5 National Audit of Major Complications of Central Neuraxial Block in the United Kingdom. 3rd National Audit Project of the Royal College of Anaesthetists. *RCoA*, London 2009 (bit.ly/2fpOGdj).

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
- 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:

rcoa.ac.uk/documents/anaesthesia-explained



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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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Reviewed 2016

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



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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

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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Fifth Edition 2017

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

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