

Risks associated with your anaesthetic: nerve damage associated with general anaesthetic

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Nerve damage associated with general anaesthesia

What is the nervous system?

Our nervous system consists of:

- The brain - the central processor of the system.
- The spinal cord - carries signals to and from the brain. It links the brain to the peripheral nerves.
- Peripheral nerves - run between the spinal cord and the rest of the body. These include the following:
 - * Sensory nerves - that bring information into the brain about touch, pain, position and temperature.
 - * Motor nerves - carry messages from brain to control muscle activity
 - * Mixed nerves - are partly motor and partly sensory.

What symptoms can be caused by nerve damage and how long do they last?

- Damage to sensory nerves can cause numbness, tingling or pain. The pain can be a continuous ache or a sharp shooting pain. You may also get inappropriate warm or cold sensations. Symptoms can start immediately after an injury to a nerve, or may not appear until several weeks after the initial injury. Damage to motor nerves leads to weakness or paralysis of the muscles in the area supplied by the nerve. These effects may last for variable time periods. Most symptoms resolve within 3 months but full recovery may take up to a year or longer. Rarely (less than 1 in 1000 anaesthetics) nerve damage is permanent.

What increases the risk of nerve compression and consequent damage?

- Certain positions required for surgery e.g. lying on your back with legs raised and spread out (genital surgery), lying on your front (back surgery), lying on your side (kidney surgery)
- Certain operations e.g. long operations on breasts, neck and brain. Operations needing tourniquets to reduce bleeding e.g. knee surgery
- Previous diseases like diabetes, osteoarthritis, atherosclerosis, diabetes
- Being male and increasing age
- Being overweight or very thin

What causes spinal cord damage?

The main cause associated with general anaesthetic is inadequate blood supply to the spinal cord.

This can happen due to persistent low blood pressure, a clot blocking the blood vessels or compression of blood vessels leading to oxygen starvation of the spinal cord.

How does peripheral nerve damage happen?

There are several ways a nerve can be damaged during an operation.

- Compression and stretching- this can damage nerves when you are placed in certain positions under general anaesthetic to allow surgery to be done, e.g. lying on your front for back surgery.
- Tourniquets used to reduce bleeding during surgery can also cause nerve damage. Therefore, the pressure of the tourniquet and the time it is used are carefully monitored.
- Very rarely, your tongue nerves might be damaged by the equipment used to secure a clear airway.
- Surgical equipment, like retractors, that are used to hold structures in the body out of the way, so the surgeon can see more deeply into the body, can cause pressure damage to nerves.
- Direct injury - the surgeon may damage a nerve as he/she operates. Surgical instruments can also cause direct injury to nerves.
- Inadequate blood supply- each nerve has its own blood supply that provides food and oxygen to it. This can be compromised due to pressure or stretching. It is more likely in people who already have narrowed blood vessels e.g. coronary heart disease and diabetes.
- Insertion of cannulas (drip) and peripheral nerve blocks can cause damage to nerves by direct injury, haematoma (blood clot), inadequate blood supply and infection. 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 offering you a nerve block.
- Catheters used for prolonged nerve blocks may get infected and lead to nerve damage.

- Damage to the spinal cord is rare occurring in less than 1 in 170,000 anaesthetics. It affects both muscle power and sensations, depending on the location of the injury. Unfortunately this sort of damage is usually very painful, extensive and permanent. Bowel and bladder control may also be affected.

What are the most common nerve injuries?

The ulnar nerve in the arm is the most common reported nerve injury.

It can get compressed at the elbow, where it is very close to the skin.

This can cause weakness of the hand muscles and/or numbness of the 4th and 5th fingers.

The common peroneal nerve at the knee is the other commonly injured nerve.

This can result in inability to lift the foot off the ground and/or numbness on the top of the foot.

What is done to prevent peripheral nerve damage?

Your anaesthetist, surgeon and theatre staff take care to try and prevent nerve damage.

They share the responsibility of minimising nerve injury by carefully padding all vulnerable areas, appropriate positioning to avoid nerve compressions and stretching, avoiding prolonged bed rest and by raising awareness of the possibility of nerve damage during surgery.

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What can be done if there is nerve damage?

A neurologist may assess your nerve damage using techniques like Magnetic Resonance Imaging (MRI), Computerised Tomography (CT scan) and nerve conduction studies.

Suggested treatment consists of physiotherapy, pain relieving drugs or small operations to repair the nerve.

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