

## What is a Lumbar Puncture?

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A lumbar puncture is a diagnostic test performed to remove a small amount of the cerebrospinal fluid from the lumbar region in the back. Cerebrospinal fluid is a clear fluid that bathes and cushions the brain and spinal cord, protecting them against injuries, it is continuously made and reabsorbed in the brain.

During the lumbar puncture procedure, a fine needle is inserted between 2 lumbar vertebrae (back bones) through which a sample of cerebrospinal fluid is aspirated.

This procedure can help in the diagnosis of infections like meningitis. It can also be performed for the diagnosis of diseases affecting the brain and spinal cord such as multiple sclerosis, leukaemia and cancers.

In some cases, a lumbar puncture may be used to inject an anaesthetic agent or chemotherapy medication into the cerebrospinal fluid.

## Why is a Lumbar Puncture required?

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Infections, cancer, or any other abnormalities related to the brain and spinal cord can be detected by the pathological examination of the cerebrospinal fluid.

Lumbar puncture is required for:

- The collection a sample of the cerebrospinal fluid for pathological analysis
- The administration of spinal anaesthesia and chemotherapy drugs
- Measurements of the pressure in the cerebrospinal fluid

The indications for lumbar puncture include:

- The diagnosis of blood cancers that may be affecting the central nervous system
- Subarachnoid haemorrhage
- Bacterial, viral, and fungal infections such as meningitis, syphilis, and encephalitis
- Inflammatory and degenerative conditions of the nervous system like multiple sclerosis

## What are the side effects of the procedure?

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The lumbar puncture is generally considered safe. In rare cases, it may cause a few side effects as described below:

- Patients may develop a headache after lumbar puncture due to the leakage of fluid into the surrounding tissues. The headache usually begins a few hours to one or two days after the procedure. It is often accompanied by dizziness, nausea, and vomiting.
- Bleeding from the site of puncture into the epidural space may occur in rare cases.
- Some patients experience pain, discomfort, and tenderness in the lower back after lumbar puncture. The pain may radiate down along the back of the legs.
- In patients with increased intracranial pressure due to brain cancer or space-occupying lesion, a lumbar puncture may cause a sudden compression of the brainstem resulting in brainstem herniation. However, this complication is rare. It can be avoided by performing a CT scan or MRI before the procedure to determine the presence of a space-occupying lesion.

## How do I prepare for a Lumbar Puncture?

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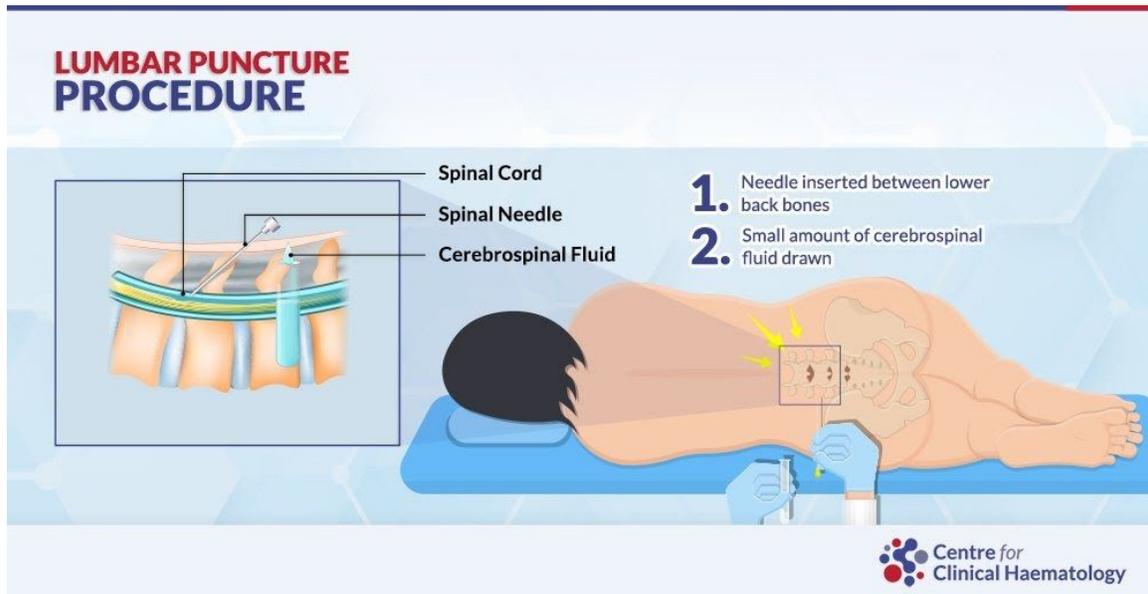
Before the lumbar puncture, the doctor will do your physical examination, ask questions about your medical history, and recommend blood tests to rule out any bleeding and clotting disorders.

Patients should inform the doctor if they are on any blood-thinning or anticoagulant medication. In addition, they should declare the history of allergies to any medication, including anaesthetic agents.

Specific instructions about the intake of food, drinks, and medications are given by the doctor. Patients are usually advised to avoid the intake of food and drinks for a period of 8 to 12 hours before a lumbar puncture if sedation is required.

The doctor may advise a CT or MRI scan if they are concerned about the possibility of any abnormal swelling in the brain.

## What happens during the procedure?



A lumbar puncture is performed in a clinic or an outpatient facility. Your doctor will discuss with you the potential risks involved in the procedure and the preparation needed before the procedure. The doctor will also inform you how you might feel during the procedure.

### Before the procedure

The doctor will give instructions about the position you have to maintain during the session. Usually, you are asked to lie on one side with the knees drawn up to the chest. Alternatively, you may be asked to sit on a stable surface leaning forward slightly. These positions cause a forward bending of the back as a result of which the space between the vertebrae becomes wider. This can make it easier for the doctor to insert the needle and aspirate the cerebrospinal fluid.

## During the procedure

The back is washed and cleaned using iodine or antiseptic soap and covered with a sterile sheet.

Before inserting the needle, a local anaesthetic agent is injected into the lower back to make the site of puncture numb. The local anaesthesia may cause pain or sting briefly while it is being administered.

Then, a thin needle is inserted between the 2 lumbar vertebrae through the spinal membrane to reach the spinal canal. You may feel mild pressure in the back at this step.

Once the aspiration needle is in place, the pressure in the cerebrospinal fluid may be measured. Then, a small amount of the fluid is aspirated through the needle. You might be asked to change the position slightly to facilitate the removal of the fluid.

Then, the needle is removed gently and the site of puncture is covered with a bandage. This procedure usually takes about 30-45 minutes.

## What happens after the procedure?

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It is advisable to lie down for a few minutes after the procedure. Patients should avoid performing strenuous activities on the day of the procedure. They may resume their routine activities or return to their work provided the tasks do not involve intense physical activities.

Patients may take a dose of over-the-counter pain-relieving medications containing paracetamol to relieve back pain and headaches.

## What happens with my collected samples?

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The spinal fluid samples are sent to a laboratory for analysis, where laboratory technicians check for a number of things when examining spinal fluid, including:

- General appearance – Spinal fluid is normally clear and colourless, if it's cloudy, yellow or pink in colour, it might indicate abnormal bleeding, disease infiltration or infection.
- Protein – Elevated levels of total protein may indicate an infection or another inflammatory condition.
- White blood cells – Increased numbers of mononuclear leucocytes (white blood cells) may indicate an infection.

- Sugar (glucose) – A low glucose level in spinal fluid may indicate infection or another condition.
- Microorganisms – The presence of bacteria, viruses, fungi or other microorganisms can indicate an infection.

Laboratory results are combined with information obtained during the test, to help establish a possible diagnosis.

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