

Lumbar puncture in babies and children

Information for families

What is a lumbar puncture?

A lumbar puncture, or **LP**, is a common procedure which involves inserting a very fine needle into the lower back. This allows us to collect a small sample of the fluid that surrounds the brain and spinal cord — this is called cerebrospinal fluid (**CSF**).

Why is a lumbar puncture done?

Lumbar punctures are very useful tests for diagnosing a number of different conditions. Most commonly, lumbar punctures are done to look for bacteria and viruses which could be causing **meningitis** (an infection of the lining of the brain) or **encephalitis** (inflammation of the brain itself). These are most commonly performed on babies under 3 months of age who develop fever, although can be done for children of any age based on signs and symptoms.

In some children, lumbar punctures are done for other reasons, for example to measure the pressure inside the skull or to perform other specialist tests. Your medical team will explain exactly what they are looking for before the procedure.

How is a lumbar puncture done?

If your baby or child is felt to require a lumbar puncture, this will be discussed with you by their medical team. Lumbar punctures are a common test done in paediatrics, but can be an understandably daunting thought. Please feel free to ask any questions you would like to so that you feel fully informed prior to the procedure.

Before the procedure:

- Numbing cream is often applied to the back to keep your child or baby comfortable during the procedure
- For babies, we often give them a small amount of sugary fluid to suck on which helps to keep them calm and comfortable
- For older children, we might use medicines to help them to remain calm for the procedure
- Sometimes we will discuss doing the procedure under general anaesthetic to help minimise the distress for your child
- A small heel prick sample of blood is usually taken to check their blood glucose.

During the procedure:

- Your baby will be curled on their side and held in position by a nurse or doctor. Children are also usually positioned on their side, although occasionally will sit upright.
- The skin is thoroughly cleaned to prevent introducing infection
- A very fine needle is inserted between the bones of the lower back
- A small amount of fluid is collected and sent to the laboratory.

After the procedure:

- The skin will be cleaned with sterile water and a barrier spray applied to protect the area
- A plaster will be placed over the site.

What are the risks?

Lumbar punctures are generally safe, well tolerated procedures. Before a lumbar puncture is performed, the medical team will ensure that there are no reasons to avoid doing the procedure by checking blood tests and other clinical factors.

The main risks include:

- **Failure:** the procedure may be unsuccessful, and we might need to try more than once to get the sample. (success rate for the first lumbar puncture attempt in small babies is 50–64%, and around 65% of children)^{1,2}
- **Back pain:** Some children complain of localised back pain after lumbar puncture around the needle insertion site. (15-40% of children)³
- **Headache:** Some children complain of headaches after a lumbar puncture due to the slight reduction in pressure after fluid is removed. This usually improves with simple painkillers and rest, particularly lying flat. (11% of children)^{4,5}
- **Nerve damage:** the needle is inserted low down in the back, below where the spinal cord ends, which means it is extremely unlikely that there would be any nerve damage. (the risk of temporary nerve root irritation causing pain is 11%, risk of significant nerve damage is extremely rare).⁶
- **Bleeding:** small amounts of bleeding can occur at the site of the needle insertion, but this is usually not significant. (0.1% risk of significant bleeding)⁷
- **Infection:** there is a very small risk of introducing infection, however, the procedure is done under sterile conditions to minimise this risk. (less than 0.1%)^{6,8}
- **Fluid leak:** Some fluid can leak out of the hole made by the needle or cause swelling under the skin. This is not dangerous and will resolve over time. In very rare cases a fluid collection can occur.⁹

How long does it take to get the results?

The laboratory will review the spinal fluid under the microscope looking for visible bacteria. This result is usually reported within hours of the procedure. We also get some other information in the first few hours about the contents of the spinal fluid, for example its sugar and protein content, which can help to guide us in our treatment. The spinal fluid is then cultured for 48 hours in the laboratory to see if any bacteria or viruses grow.

If the fluid has been sent for other specialist tests, these may take days or weeks to be reported.

Further Information

You will be able to discuss this further with the paediatric medical team.

References

1. <https://pubmed.ncbi.nlm.nih.gov/17321005/>, 2. <https://pubmed.ncbi.nlm.nih.gov/36460015/>, 3. <https://pubmed.ncbi.nlm.nih.gov/15173478/>, 4. <https://pubmed.ncbi.nlm.nih.gov/33190071/>, 5. <https://pubmed.ncbi.nlm.nih.gov/29223694/>, 6. <https://pubmed.ncbi.nlm.nih.gov/29452686/>, 7. <https://pubmed.ncbi.nlm.nih.gov/38563812/>, 8. <https://pubmed.ncbi.nlm.nih.gov/39552070/>, 9. <https://pubmed.ncbi.nlm.nih.gov/17885251/>