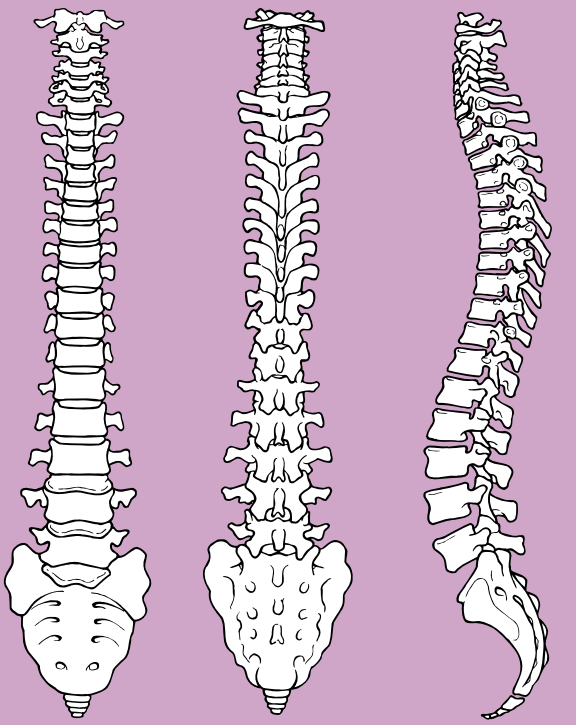
BASS
British Association of Spine Surgeons

Lumbar Disc Protrusions – Surgical Options



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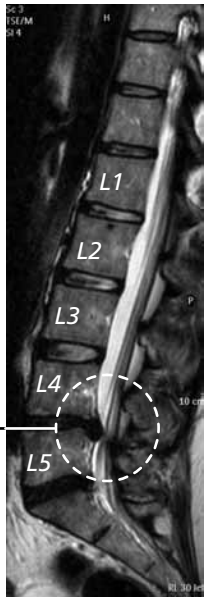
Following your recent MRI scan and consultation with your spinal surgeon, you have been diagnosed as having a lumbar disc protrusion, resulting in nerve root compression (trapped nerve) and leg pain (sciatica).

This is an example as shown on an MRI scan

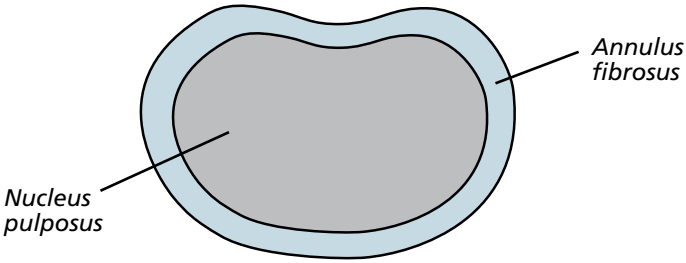


L4/5 disc protrusion and area of nerve compression

The normal lumbar spine has a central canal (passage) through which tiny nerve rootlets splay out like a horse's tail forming the cauda equina. To each side of the canal, spinal nerve roots branch out at every level. The cauda equina and nerve roots are surrounded by cerebrospinal fluid (CSF) and are all contained within a membrane, or covering, called the dura mater, rather like the thin layer that covers a boiled egg.

There are five bones (vertebra) in the lumbar spine (lower back). In between each bone is an intervertebral disc, which acts as both a spacer and a shock absorber. The disc is composed of two parts: a soft gel-like middle (nucleus pulposus) surrounded by a tougher fibrous wall (annulus fibrosus).

Overhead view of an intervertebral disc (simplified)

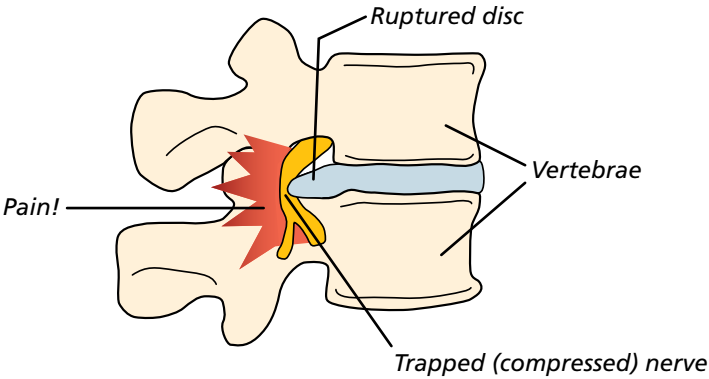


Over time, as degeneration (wear and tear) occurs, the intervertebral disc can lose its flexibility, elasticity and shock absorbing characteristics. The tough fibrous wall of the disc may then weaken and split and no longer be able to contain the gel-like substance in the centre.

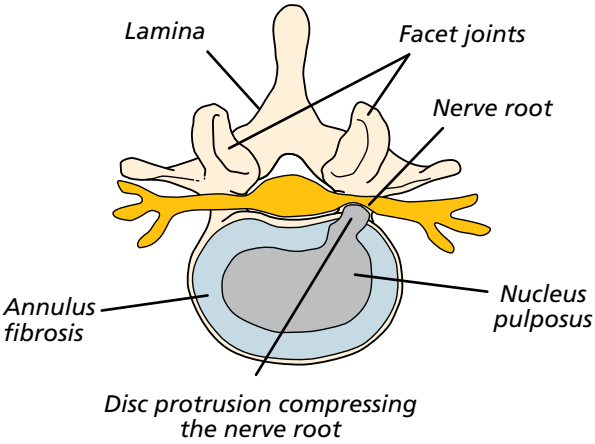
This material may bulge or push out through a tear in the disc wall (herniation), causing pain when it touches a nerve (sciatica). A nerve is like an electrical wire. It tells your muscles to move and tells your brain information about various sensations such as pain, temperature, light touch, pressure sensation and the position of your legs.

Lumbar nerve root pain generally goes below the knee and is felt in the area of the leg that the particular spinal nerve supplies. Symptoms also associated with sciatica include altered sensation, pins and needles, burning, numbness or even weakness of the muscles in the leg that the nerve supplies.

Side (lateral) view of the spine showing a ruptured disc



Overhead (axial) view of a ruptured disc



Very few people who have a lumbar disc prolapse need surgery. It is unusual to operate before 6–12 weeks because a significant number of people do get better naturally. This can happen if the disc or swelling around a nerve decreases naturally (with time) or is helped by image-guided steroid injection.

Six out of 10 patients can get better spontaneously after six weeks, while 7–8 out of 10 patients will feel better by three months. In general, most people with leg symptoms will get better over time. Other than signs of nerve damage, surgery is usually only considered by a doctor when the pain is very bad and has not got better with strong pain relief after this time.

There is a balance of waiting while nature gets you better, versus waiting too long which might prolong your suffering and pain or compromise nerve function (weakness, numbness or pain recovery). In rare cases the nerves which control your bladder, bowel and sexual function can be compressed. This is known as cauda equina syndrome(CES) and often requires urgent surgical intervention. Fortunately, immediate spinal surgery is only necessary in a few cases.

The operation

The operation is commonly called a discectomy. However, in this situation, only the protruding disc material is removed, not the whole disc.

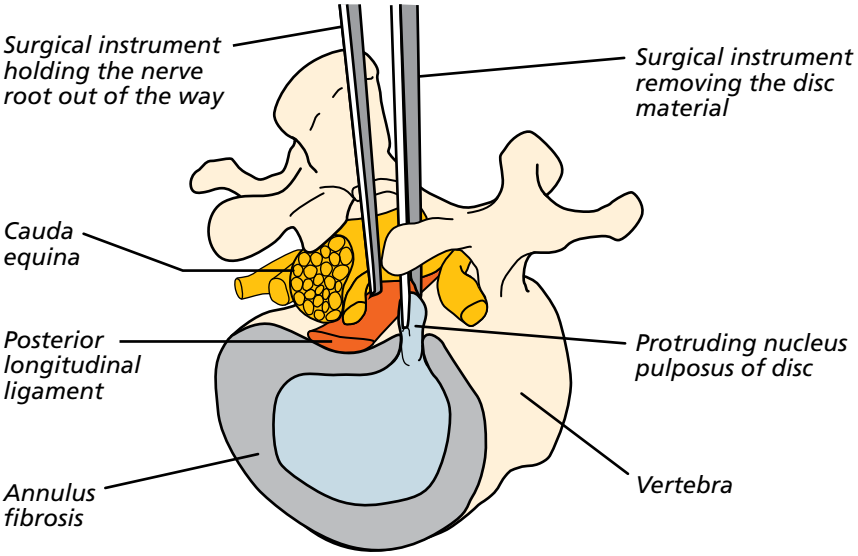
There are several different techniques when performing an operation for lumbar disc protrusion. Expected outcomes from all methods of treatment are very similar and the choice of operation will be decided by the surgeon, with consideration of patient's preference and personal circumstances.

Microdiscectomy

This is performed through an incision in the midline of the lower back (usually a small wound up to 4 cm (1½ inches) in length but sometimes it needs to be longer).

First the muscles are held apart to gain access to the bony arch and roof of the spine (lamina). The surgeon is then able to enter the spinal canal by removing a membrane in between the lamina and over the nerve roots (ligamentum flavum). Often, a small portion of the inside facet joint is removed, both to enable access to the nerve root and to remove pressure on the nerve. A microscope is used at this point to give greater magnification of the structures. The nerve root is then gently moved to the side and the disc material is removed from under the nerve root. The disc is then entered, to remove any loose fragments of the disc material within it.

View of the surgical removal of the protruding disc material



Minimally invasive (tubular) discectomy

With an approach similar to that of microdiscectomy, the surgeon attempts to reduce muscle dissection and injury by working through a narrow tube.

Transforaminal endoscopic discectomy (sometimes known as TESS or TESSYS)

With the most minimal approach currently available, the surgeon introduces a telescope into the spine through a short 1 cm incision just to one side of the midline of the spine. The scope is connected to a high definition camera system. This procedure is commonly performed under local anaesthetic and intravenous sedation (so you are sleepy, but slightly aware of the surgery).

Interlaminar endoscopic discectomy (sometimes known as ILESSYS).

In a similar way to TESS, a scope is introduced through a short incision in the midline of the spine.

The nature of spinal surgery is not a 'cure', and cannot prevent further disc degeneration, but is aimed to provide benefit with a high percentage improvement and relief of leg symptoms. Sometimes however, numbness or weakness can persist, even with a technically successful operation. Good relief from leg pain following disc surgery usually occurs in approximately 85–90% of cases (up to 9 out of 10 people). This is not necessarily felt immediately but over a period of time, sometimes several weeks. Relief from back pain, however, is less reliable and should not be regarded as the main aim of the surgery.

Risks and complications

As with any form of surgery, there are risks and complications associated with it. These include:

- damage to a nerve root. This occurs in less than 1 out of 100 cases of primary surgery but is much more common in revision or 're-do' surgeries where injury can occur in up to 10 out of 100 cases. If this happens, you may get weakness in the muscles supplied by that particular nerve root and/or numbness, tingling or hypersensitivity in the area of skin it supplies;
- tearing of the outer lining or covering which surrounds the nerve roots (dura). This is reported in fewer than 5 out of 100 cases. It may occur as a result of the bone being very stuck to the lining and tearing it as the bone is lifted off. Again, it is much more common in 're-do' surgery. Usually the hole or tear in the dura is repaired with stitches, a patch or a special glue. If the puncture or hole re-opens you may get cerebrospinal fluid (CSF) leaking from the wound, headaches or, very rarely, meningitis. Although rare, the problems of leakage can persist. This could result in you having to return to theatre to enable the surgeon to revise the repair of the dura but the risk of a second operation being required within a few days or weeks is less than 0.05%;
- recurrent sciatica. This can occur as a result of scarring or further disc protrusion (occurring in approximately 5 out of 100 cases at any time from a few days to several years later);

- problems with positioning during the operation, which might include pressure problems, skin and nerve injuries, and eye complications including, very rarely, blindness. Special gel mattresses and operating tables are used to minimise this;
- infection. Superficial wound infections may occur in up to 4 out of 100 cases. These are often easily treated with a course of antibiotics. Deep wound infections may occur in fewer than 1 out of 100 cases. These can be more difficult to treat with antibiotics alone and sometimes patients require more surgery to clean out the infected tissue. This risk may increase for people who have diabetes, impaired immune systems or are taking steroids;
- bleeding. You **must** inform your consultant if you are taking tablets used to 'thin the blood', such as warfarin, aspirin, rivaroxiban or clopidogrel. It is likely you will need to stop taking them before your operation as they increase the risk of bleeding. Taking medication like non-steroidal anti-inflammatories (NSAIDs) could also increase your risk of bleeding and your surgeon will advise you if you need to stop taking these before your operation. If your operation is scheduled with only a week's notice, please check with your consultant or nurse if any medications you take need to be stopped to prevent your surgery being delayed; and
- blood clots (thromboses) in the deep veins of the legs (DVT) or lungs (PE). These occur when the blood in the large veins of the leg forms blood clots and may cause the leg to swell and become painful and warm to the touch. Although rare, if not treated this could be a fatal condition if the blood clot travels from the leg to the lungs, cutting off the blood supply to a portion of the lung. It is reported as happening in fewer than 1 out of 700 cases. There are many ways to reduce the risk of a blood clot forming. The most effective is to get moving as soon as possible after your operation. Walk regularly as soon as you are able to, both in hospital and when you return home. Perform the leg exercises as shown to you by the physiotherapist and keep well hydrated by drinking plenty of water. Ladies are also advised to stop taking any medication which contains the hormone oestrogen (like the combined contraceptive pill or HRT) four

weeks before surgery, as taking this during spinal surgery can increase the chances of developing a blood clot.

There are also very rare but serious complications that in extreme circumstances might include:

- damage to the cauda equina resulting in paralysis (the loss of use of the legs, loss of sensation and loss of control of the bladder and bowel). This can occur through bleeding into the spinal canal after surgery (a haematoma). If an event of this nature were to occur, every effort would be made to reverse the situation by returning to theatre to wash out the haematoma. Sometimes, however, paralysis can occur as a result of damage or reduction of the blood supply to the nerves or spinal cord and this is, unfortunately, not reversible;
- stroke, heart attack or other medical or anaesthetic problems; and
- extremely rarely, death; as a result of damage to major blood vessels or vital organs at the front of the spine, which is reported as happening in 1 out of 10,000 cases; or general anaesthetic fatal complications which have been reported in 1 out of 250,000 cases.

What to expect after surgery and going home

For microdiscectomy and minimally invasive discectomy:

Immediately after the operation you will be taken on your bed to the recovery ward where nurses will regularly monitor your blood pressure and pulse. Oxygen will be given to you through a facemask for a period of time to help you recover from the anaesthetic. You will have an intravenous drip until you are able to drink adequately.

A drain (tube) may be placed near the surgical incision if there has been significant bleeding during the operation. This removes any excess blood or fluid collecting under the wound. The drain will be removed when the drainage has stopped, usually the next day, after surgery.

It is very normal to experience some level of discomfort or back and leg pain after the surgery. The nursing and medical staff will help you to control this with appropriate medication. The symptoms in your legs may fluctuate due to increased swelling around the nerves. As the nerves become less irritated and swollen, your leg pain should settle. This can take 6–8 weeks, or longer. It is important not to suddenly stop taking certain pain relief medication. It may be necessary to gradually 'wean' yourself off them – your GP can advise you if necessary.

The ward physiotherapist will visit you after the operation to teach you exercises and help you out of bed. They will show you the correct way to move safely. Once you are confident and independently mobile, you will be encouraged to practise climbing stairs with the physiotherapist. Once stable, you will be allowed home, sometimes the same day but usually on the day after surgery.

For TESS and ILESSYS:

Generally you are asked to rest in bed for two hours, then gently mobilise for a further two hours, before you are discharged home.

Please arrange for a friend or relative to collect you, as driving yourself or taking public transport is not advised in the initial stages of recovery. If you qualify for patient transport and are likely to require this service, please let one of the nurses know as soon as you can as this may need to be pre-arranged or your discharge home could be delayed.

Wound care

Skin wound closure depends on your surgeon's preference, and include absorbable sutures (stitches), removable sutures or clips (surgical staples).

If you have removable sutures or clips, you will be advised by the ward nurse to arrange an appointment with your GP's practice nurse, usually 10–14 days after the operation, for them to be removed.

If you have absorbable sutures, you will be advised by the ward nurse whether you need to make an appointment with your GP's practice nurse to have a wound check or when you can take off the dressing yourself.

You may shower 48 hours after surgery if you are careful but you must avoid getting the dressing too wet. Most dressings used are 'splash-proof', but if water gets underneath, it will need to be changed. A simple, dry dressing from a pharmacy is sufficient to use. Bathing should be avoided for two weeks.

Please contact your hospital or your GP if you think your wound might be infected. Symptoms could include:

- redness around the wound;
- wound leakage; or
- you have a high temperature.

Once the wound has been checked and if the scar is sensitive to touch, you can start to massage around the scar using an unperfumed cream or oil to encourage normal sensation and healing.

Driving

Normally you will be advised to avoid driving for 2–4 weeks, depending on the type of surgery you have had. If you have no altered sensation or weakness in your legs, you may resume driving if you feel safe to do so, but you must be confident to do an emergency stop. It is advisable not to travel for long distances initially (no longer than 20 minutes), without taking a break to 'stretch your legs'. Gradually increase your sitting tolerance over 4–6 weeks.

Recreational activities

It is important to keep mobile after surgery. You will find you get stiff if sitting for longer than about 20 minutes, so get up

and walk about regularly. Walking outside is fine but again, increase your walking distances gradually. The fibrous wall of the disc cannot be repaired during surgery and will heal at different times for everybody, so you will be advised to avoid lifting anything heavy, certainly for the first 2–3 weeks, but maybe for as long as three months, after your operation. Having surgery does not prevent you from developing further disc degeneration.

Please check with your consultant and physiotherapist when you are able to resume specific activities, such as swimming or running, as the advice could range from between two weeks to three months. A gradual return to sport is then advisable. You should avoid flying for six weeks (and long-haul flights for up to three months).

Work

Returning to work is dependent both on your recovery and your job. Most people are off work for an initial two weeks but if you are in a strenuous job you may need up to six weeks. It is always sensible to discuss with your employer if you can return on 'light duties' or reduced hours at first. There is usually nothing to stop you doing computer/office work at an earlier date, as long as you can keep moving about. The hospital will issue you with a fitness to work (off work) certificate or you may ask your GP.

Follow-up

Your surgeon will advise you when you should attend clinic after your operation. If you have any queries before your follow-up date do please contact the nurse specialist or other member of your consultant's team.

If you have any questions regarding the information in this booklet, please do discuss them with either the ward nurses or a member of your consultant's team.

What is the British Spine Registry (BSR)?

The British Spine Registry aims to collect information about spinal surgery across the UK. This will help us to find out which spinal operations are the most effective and in which patients they work best. This should improve patient care in the future.

The Registry will enable patient outcomes to be assessed using questionnaires. These will allow surgeons to see how much improvement there has been from treatment.

This has worked for hip and knee joint replacements through the National Joint Registry. We need your help to improve spinal surgery in the UK.

What data is collected?

Your personal details allow the BSR to link you to the surgery you have had. They also allow us to link together all the questionnaires you complete. If you need any further spinal surgery in the future, details of previous operations will be available to your surgeon.

Personal details needed by the BSR are your name, gender, date of birth, address, email address and NHS number.

Your personal details are treated as confidential at all times and will be kept secure. This data is controlled by the British Association of Spine Surgeons (BASS) and held outside the NHS. Personal details will be removed before any data analysis is performed, retaining only age and gender. Your personal data and email address will not be available to anyone outside BASS and its secure IT provider. Anonymised data may be released to approved organisations for approved purposes, but a signed

agreement will restrict what they can do with the data so patient confidentiality is protected.

Your personal data is very important, as this will allow us to link details of your diagnosis and surgery with any problems or complications after surgery. You may also be asked to complete questionnaires before and after surgery to work out how successful the surgery has been. These will only be possible if we can connect you to the questionnaires through your personal details.

Do I have to give consent?

No, your participation in the BSR is voluntary and whether you consent or not, your medical care will be the same. Your personal details cannot be kept without your consent. This will be obtained either by asking you to physically sign a consent form or electronically sign one through an email link to a questionnaire or at a questionnaire kiosk in the outpatient clinic.

You can withdraw your consent at any time or request access to your data by:

- going to the patient section of the BSR website at www.britishspineregistry.com; or
- writing to us at the BSR centre (see address overleaf). Please state if you are happy for us to keep existing data, but do not want to be contacted, or whether you want your data to be anonymised (so it cannot be identified).

Research

Your consent will allow the BSR to examine details of your diagnosis, surgical procedure, any complications, your outcome after surgery and your questionnaires. These are known as ‘service evaluations’ or ‘audits’.

Operation and patient information, including questionnaires in the BSR, may be used for medical research. The purpose of this research is to improve our understanding and treatment

of spinal problems. The majority of our research uses only anonymised information which means it is impossible to identify individuals. From time to time, researchers may wish to gather additional information. In these cases we would seek your approval before disclosing your contact details. You do not have to take part in any research study you are invited to take part in and saying no does not affect the care you receive.

All studies using data from the Registry will be recorded on the BSR website at www.britishspineregistry.com

Children

Parents are asked to consent for data to be collected from their child. Looking at the outcome of spinal surgical procedures is just as vital in children as it is in adults.

Further information

The BSR website at www.britishspineregistry.com contains more information, including details of any studies and any information obtained through the Registry data.

To contact the BSR, write to:
The British Spine Registry
Amplitude Clinical Services
2nd Floor Orchard House
Victoria Square
Droitwich
Worcestershire WR9 8QT

For more information about microdiscectomy go to:
www.spine-health.com/video/lumbar-microdiscectomy-surgery-video

For more information about TESS / ILESSYS, go to:
www.joimax.com/en/patients/treatments/herniated-disc-treatment/

Produced, researched and revised by spinal nurse specialist Helen Vernau on behalf of the BASS Consent and Patient Information Committee.

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