

Discs

Discs are the supple pads between each of the bones that make up the spinal column. Each one is a flat, circular capsule approximately 2.5 cm in diameter and 0.5cm thick with a tough, fibrous, outer layer called the annulus fibrosis and a soft jelly-like inner core called the nucleus pulposus. They are held firmly in place by ligaments connecting the spinal bones and the surrounding sheaths of muscle.

Discs are a key part of the spinal joints and their function is to separate the vertebrae and prevent them rubbing together. Discs also offer some shock absorption for the spine.

They are identified by using the number of the vertebrae above and below the disc, for example L4/5 means the disc between vertebra 4 and vertebra 5 in the lumbar (low back) spine and C6/7 means the disc between vertebra 6 and vertebra 7 in the cervical (neck) spine

Problems that can occur with discs

There is virtually no room for discs to actually move or slip, although the normal ageing process makes the outer membrane weaker and the inner core harder and less flexible - often referred to as 'wear and tear'. This makes the discs more prone to injury and tiny ruptures or cracks in the outer layer of the disc may occur allowing the disc to bulge, break open, or break into pieces and the gel inside to be forced out. This sometimes causes very severe pain and sometimes causes no pain at all.

Disc problems of this kind can occur anywhere in the back although are most common in the low back (lumbar spine) and then the neck (cervical spine). They can affect people of any age although are most common in men and women between the ages of 30 and 50.

Although most disc problems are a result of the normal ageing process combined with poor posture and are brought on by everyday activities such as lifting or stretching awkwardly, they can also be the result of trauma, injury or disease. And sometimes a disc can swell, tear or degenerate without any apparent cause.

Terms used to describe disc problems

- ◆ Slipped
- ◆ Bulging
- ◆ Ruptured
- ◆ Herniated
- ◆ Prolapsed
- ◆ Sequestered
- ◆ Degenerative disc disease
- ◆ Discitis

Most of these words are different ways of saying the same thing. The expression '**slipped disc**' is rarely used now and is something of a misnomer as a disc cannot actually slip anywhere. However the inner softer part of the disc can **bulge** out slightly from its normal space through a weakness in the outer part of the disc. If the bulge breaks through the annulus fibrosis it is referred to as a **ruptured, herniated** or **prolapsed** disc.

A **sequestered** disc means that part of the disc has broken free and found its way into the spinal canal - the space in the vertebrae through which the spinal cord passes.

Degenerative disc disease refers to a combination of problems in the spine that start with damage to the disc but eventually begin to affect all parts of the spine. It is quite common and is often without symptoms although for some people it can result in severe, constant and chronic pain. It is not clear why this happens to some people and not others although heredity certainly plays a significant role.

Discitis is an inflammation of a disc or disc space which may lead to the disc being eroded and damaged. The cause is unknown but discitis is sometimes seen as a non-bacterial inflammation attributed to non-infective processes, eg a chemical reaction to an injected substance.

Symptoms of damaged discs

The symptoms of a damaged or *bulging disc can vary and there can be pain in the back or neck and/or in the buttocks, legs or arms. Sometimes the injured disc itself is a source of pain and sometimes the pain comes from a nerve or nerves exiting the spinal canal being compressed by the bulging disc. Disc damage can also sometimes have a 'knock-on-effect' resulting in facet joints being displaced or spinal muscles going into spasm, other possible sources of pain.

The severity of the symptoms will depend on how much the disc is bulging and where the bulge is. Bulging material from the inner core of a degenerating disc is very inflammatory and can cause pain around the area of the bulge or anywhere along the affected nerve. Generally, the larger the bulge, the more severe the symptoms are likely to be.

Sometimes, as well as or instead of pain, there can be numbness, tingling, weakness or pins and needles. If there is numbness in both legs, together with loss of bladder or bowel control, medical care should be sought immediately as this could be a sign of a rare but serious problem called **cauda equina syndrome**.

*The terms 'ruptured', 'herniated', 'prolapsed' or 'slipped' can also be used.

Diagnosing disc problems

A bulging disc cannot be seen or felt by a doctor although sometimes pain symptoms clearly point to this diagnosis. An X-ray will not show a bulging disc, although an MRI or CT scan usually will. The only way to ascertain for certain whether a disc is itself generating pain (rather than causing pain by pressing on a nerve) is by a discography which involves injecting a dye into the disc under pressure to see if the pain is reproduced.

How best to avoid disc problems

It is not always possible to avoid disc problems but the chances can be minimised by:-

- ◆ staying fit and flexible through doing regular, moderate exercise;
- ◆ keeping your weight down – obesity puts excessive strain on the spine and the ligaments that hold the discs in place;
- ◆ having good posture - poor posture is a major factor in spine problems. When you stand or walk, keep your shoulders down, your chin back, and your stomach in to help support your lower back;
- ◆ protecting your back when you lift - bend your knees and lift with your legs, not your back;
- ◆ not smoking - smoking appears to be a factor in disc health;
- ◆ maintaining strong spinal muscles and avoiding lifting excessive loads or lifting and twisting at the same time, particularly if you have had disc problems in the past.

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Treatment for disc problems

- ◆ In most cases, symptoms from a disc with a small bulge get better without treatment within approximately six weeks. Sometimes a few days rest to take the pressure off is needed but the usual advice is to do normal activities as much as possible together with gentle and regular exercise (such as walking and swimming). Staying in bed for more than one or two days can weaken muscles and make the problem worse.
- ◆ If there is inflammation around the bulging disc an ice pack (or a packet of frozen peas wrapped in a tea towel) can help reduce the inflammation and therefore the pain. Try using it for 10 to 15 minutes every two to three hours. (See our fact sheet on Hot and Cold Therapies.)
- ◆ Medication won't cure a herniated disc, but it may help with pain and swelling. Analgesics such as Paracetamol and anti-inflammatories such as Ibuprofen can be bought over the counter and if you need something stronger your GP can give you a prescription. (See our fact sheet on Drugs for Pain Relief.)
- ◆ Manual therapy such as physiotherapy, osteopathy, chiropractic, or even a good massage from a professional sports masseuse may help. (See our fact sheet on Physiotherapy.)
- ◆ If your physiotherapist has given you exercises to strengthen your back muscles and/or improve your posture and muscle balance it is not only important that you do them, but it is essential that you do them correctly. If you are not sure whether you are doing them correctly, check with your therapist.
- ◆ Sometimes disc problems can result in extreme and debilitating pain. If this is the case it is advisable to go to your doctor who will almost certainly refer you to a spinal specialist who may suggest a range of options including epidural injections (see our fact sheet on Epidural Injections) or various kinds of non-surgical or surgical interventions

Non-surgical procedures for discs

- ◆ **IDET** (Intradiscal Electrothermal Therapy) is a minimally invasive treatment which involves inserting wires into a ruptured disc and heating them until some of the disc material 'melts'. This seals the rupture and deactivates the pain carrying nerves in the disc.
- ◆ **Nucleoplasty** combines thermal treatment with disc decompression and is designed to shrink the volume of the disc enough to reduce any ruptures and small protrusions and free up minor impingements on nerve roots.

Surgical procedure for discs

The form of surgery required depends on a number of factors including the type and severity of the damage and the overall health of the patient. Many surgical procedures can be performed using minimally invasive (keyhole) techniques. The vast majority of people with disc problems do not need surgery and it is not successful in all cases.

- ◆ **Discectomy** is a surgical procedure that removes all or part of the damaged disc in order to relieve pressure on impinged nerves and alleviate pain. It involves a small incision in the skin over the spine, removal of some ligament and bone material to access the disc and the removal of some of the disc

material. This surgery is sometimes performed in the traditional 'open' way and sometimes by keyhole surgery.

- ◆ **Laminectomy** is performed to create more space for the disc and nerves by removing or trimming a part of the lamina (part of the vertebra) covering the nerves to widen the spinal canal.
- ◆ **Anterior Cervical Discectomy and Fusion** is a procedure that reaches the cervical spine through a small incision in the front of the neck. The damaged disc is removed and replaced with a small plug of bone which in time will fuse the vertebrae.
- ◆ **Laminoplasty** reaches the cervical spine from the back of the neck and the spinal canal is reconstructed to make more room for the spinal cord.
- ◆ **Cervical Corpectomy** removes a portion of the vertebra and adjacent disc to allow for decompression of the spinal cord and nerves. A bone graft or metal plate is used to stabilise the spine.
- ◆ **Spinal Fusion** is a major surgical procedure that creates a solid union between two or more vertebrae to help stabilize and strengthen the spine and alleviate chronic back pain. There are many types of spinal fusion surgery, as well as many types of instrumentation including cages, plates, screws, and rods and bone graft used to secure the fusion. It is usually done to stabilize the spine. One of the disadvantages of fusion is that although the spine is stabilised, movement at that level is lost, which puts increased stress on the next vertebra possibly causing future problems.
- ◆ **Artificial Disc Replacement (ADR)** involves replacing a damaged disc with an implant and is sometimes offered instead of fusion although there is a difference of opinion amongst doctors as to which procedure is preferable. After removing the damaged disc, the ADR is inserted in the space between two lumbar vertebrae with the aim of replacing the disc while keeping normal spinal motion and avoiding additional stress on adjacent vertebrae. ADR is relatively new in the UK but has been used in Europe for many years. There are several different implant designs and your surgeon will choose the most appropriate one to fit your spinal anatomy.