In the same way that the cervical spine can be a cause of upper limb pain, the lumbar spine is a common cause of pain in the lower limbs. One of the commonest causes of this is lumbar disc prolapse causing neural compression and radicular pain.

**Etiology**

Back pain is a very common condition. More than 90% of episodes are ‘simple mechanical’ back pain. Typically this occurs in patients age 20 - 55 years and episodes are recurrent. The pain is usually relatively sudden in onset and precipitated by lifting or bending. Patients in this group usually have complete recovery in a matter of weeks with no active intervention. The pain itself is often quite severe and usually generalised over the lumbar region.

One of the commonest causes of radicular pain is a lumbar disc prolapse. Disc prolapse may by precipitated by something as innocuous as a sneeze, or lifting a relatively light object. The intervertebral disc is the ‘shock absorber’ between the vertebral bodies in the spine. These consist of the annulus fibrosus surrounding the semifluid nucleus pulposus. In a disc prolapse the nucleus pulposus herniates through the annulus fibrosus into the spinal canal. This on its own is not enough to cause radicular pain however. The disc must prolapse to the extent that it causes compression of one of the nerve roots or the central cord.

Spondylolisthesis occurs when one vertebra slips either anteriorly or posteriorly on the vertebra below it. These are also termed anterolisthesis and posterolisthesis respectively.

The condition is graded depending on the degree of slippage. If the total cross sectional length of the distal vertebra is considered as 100%.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Degree of Slippage</th>
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<tbody>
<tr>
<td>Grade I</td>
<td>0 - 25 %</td>
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<tr>
<td>Grade II</td>
<td>25 - 50 %</td>
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<tr>
<td>Grade III</td>
<td>50 - 75 %</td>
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<tr>
<td>Grade IV</td>
<td>75 - 100 %</td>
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</tbody>
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This x-ray shows a grade I spondylolisthesis of L4 on L5. It is classified as such as it can be seen the slip is less than 25% of the full width of a vertebra.
Canal stenosis will cause variable symptoms depending on the point and degree of the stenosis. The first thing to remember is that canal stenosis may be present in the absence of cord compression. In this situation symptoms are unlikely to be significant and there is no physical reason for radicular symptoms (ie pain) to develop in the limbs.

**Epidemiology**

The epidemiology of lumbar spinal pathology encompasses all patients in all age groups. Mechanical back pain affects mainly patients in the second to the fifth decade. Disc prolapse can affect patients of all age groups and is surprisingly common with around 5% of men and 2.5% of women experiencing radicular leg pain at some point in their lives. Metastatic deposits in the spine present in patients consistent with the epidemiology of the underlying malignancy.

**History and Examination**

When taking a history of back pain and radicular leg pain the first thing to consider what the underlying cause may be. Back pain may simply be mechanical pain with no significant underlying pathology. The history is often one of recurrent, spontaneously resolving episodes lasting one or two weeks.

Well localised pain which is unremitting and increasing raises the possibility of a more serious underlying disease such as malignancy. Metastases commonly arise from tumours in the kidney, prostate, breast, lung and thyroid glands.

The table below outlines the common ‘red flag’ features one should seek in all patients with back pain which, when present, should precipitate further investigation.
Inflammatory back pain refers to pain caused typically by nerve root irritation (radicular pain). One of the key features to elicit in the history is that the pain not only involves the back but also one or both of the lower limbs. This is most commonly as a result of a lumbar disc prolapse but malignancy or spondylolisthesis causing neural compression should also be considered.

The two commonest imaging modalities which are used to image the lumbar spine are plain x-ray and MRI. Plain x-ray is very good at detecting bony abnormalities such as spondylolisthesis as shown above. It will also detect more advanced lytic or sclerotic lesions.

Another common bony diagnosis is wedge fracture of the vertebral body. This x-ray shows the classic appearance of a lumbar wedge fracture.
These are often acute as a result of trauma, but they do also present in clinic as part of ongoing degeneration with back pain.

Where neural compression is being considered x-ray tells you very little about the underlying diagnosis. MRI however gives a very detailed picture. There are two modalities MRI are usually performed in; T1 and T2 weighting. These highlight different densities of tissues.

This T2 weighted MRI shows a disc prolapse of the L5/S1 disc with protrusion into the spinal canal. The cord shows as a grey line with the CSF it is bathed in as white. The discs between the lower two vertebral bodies are darker than the normal upper two as they are dehydrated and degenerate.

Non Surgical Management

All episodes of mechanical back pain are treated conservatively. Patients should be given adequate analgesia and advised to remain as mobile as possible. In recurrent cases referral for physiotherapy may be beneficial.

Spondylolisthesis is most commonly conservatively managed in much the same way as mechanical back pain.

The management of lumbar disc disease is controversial. The natural history for many patients is a symptomatic period of back pain with or without radicular leg symptoms followed by remission. This period may be weeks to months and consensus view differs on what time period is acceptable. Caudal epidural injections are useful in treating radicular leg symptoms and can be repeated quite frequently when successful.

Surgical Management

The surgical management of lumbar disc disease depends on the number of discs causing symptoms and the degree of canal stenosis.
For single level disease where a disc prolapse is the only underlying pathology simple discectomy may be adequate. In this operation the disc space is entered posteriorly and the prolapsed disc is removed.

In multilevel disease, or where there are concurrent conditions such as spondylolisthesis a laminectomy may be considered. In this operation the bony ‘roof’ of the canal is removed along with the spinous process across all the affected levels.