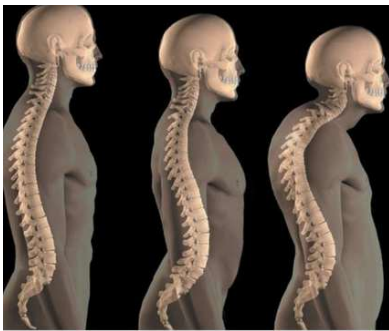
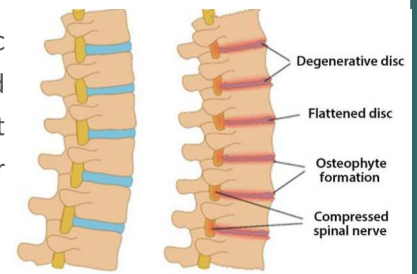


## NORMAL AGE-RELATED CHANGES IN THE SPINE

MRI and CT scans are used extensively to assist the diagnosis of acute and chronic pain originating from the spine. This information assists patients to understand what types of changes in the spine are considered “normal” with ageing and that the presence of these changes do not always result in debilitating symptoms or require medical or surgical treatment.



As with the other joints in the body, with spine undergoes changes with increasing age. These changes include loss of disc height, disc bulges, osteophytes, enlarged facet joints and overgrown soft tissues. These changes can also affect the degree of curvature of the spine, eg, increased thoracic spine kyphosis or lumbar lordosis.

A scientific review (Brinjikji et al, 2015) examined the common findings on MRI and CT scan in 3,110 individuals of different ages. The results are displayed in the graph below.

**NONE of these patients had any spinal symptoms.**

The results showed that with increasing age, from 20 years old to 80 years old, normal degeneration in the spine is commonly and increasingly visible on a CT or MRI scan even in people with no pain or other symptoms.

Imaging Finding	Age (yr)						
	20	30	40	50	60	70	80
Disk degeneration	37%	52%	68%	80%	88%	93%	96%
Disk signal loss	17%	33%	54%	73%	86%	94%	97%
Disk height loss	24%	34%	45%	56%	67%	76%	84%
Disk bulge	30%	40%	50%	60%	69%	77%	84%
Disk protrusion	29%	31%	33%	36%	38%	40%	43%
Annular fissure	19%	20%	22%	23%	25%	27%	29%
Facet degeneration	4%	9%	18%	32%	50%	69%	83%
Spondylolisthesis	3%	5%	8%	14%	23%	35%	50%

For example:

\*Disc degeneration was present in:

37% of people in their 20s, 80% of people in their 50s and 96% of people in their 80s but did NOT cause any symptoms.

\*Disc bulges were present in:

30% of people in their 20s, 60% of people in their 50s and 84% of people in their 80s but did NOT cause any symptoms.



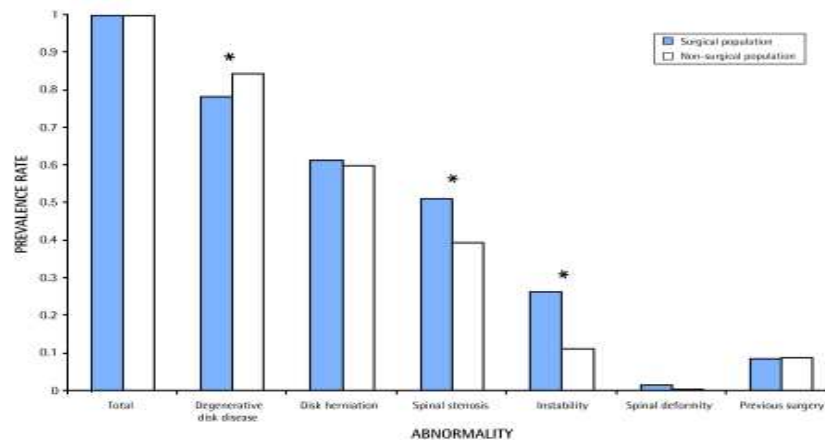
## MRI FINDINGS IN PATIENTS NEEDING SURGERY



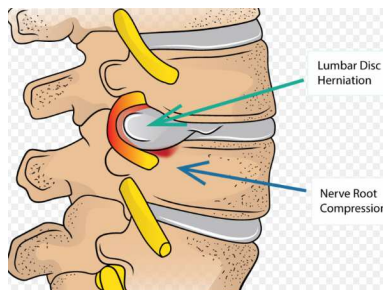
In a study of 2,021 patients assessed by a spine surgeon in Canada (Cheng et al 2010), similar MRI changes were seen in patients who did (blue) and did not (white) require surgery. The results are in the graph below.

Only patients whose MRI showed spinal instability or spinal stenosis /narrowing of the spinal cord as shown on the right were significantly more likely to require surgery.

Figure 2. The prevalence of different types of structural abnormalities present on magnetic resonance imaging for surgical and non-surgical patients



\*A statistically significant difference (P<.01) was found between the surgical and non-surgical cohorts for these abnormalities.



In patients whose scans showed **disc herniation**, the number of patients who required surgery was not statistically different to the number who did not require surgery.

These results show that many patients had disc herniation visible on an MRI scan but **only patients who had severe neurological symptoms** from the disc herniation required surgery.

## SUMMARY AND RELEVANCE TO YOU AS A PATIENT

1. Many degenerative changes visible on CT or MRI are a normal part of the ageing process, do not cause any symptoms and therefore do not require any treatment.
2. CT and MRI scans are generally not useful in the early stages of an episode of pain unless there are other neurological symptoms of concern, eg, severe nerve pain, weakness, altered sensation, paralysis or bladder or bowel problems.
3. CT / MRI/ other imaging can be useful if you have severe or debilitating symptoms that have not improved as expected over time or with treatment such as physiotherapy or pain medication.
4. Surgery is most helpful in improving debilitating symptoms if:
  - \*the changes on your CT and/or MRI fit with the pattern of your symptoms AND
  - \*your symptoms are severe and not improving with other treatment.

PLEASE FEEL FREE TO DISCUSS THIS INFORMATION WITH OUR STAFF OR YOUR SURGEON.