

### What are osteochondrosis and spondylosis?

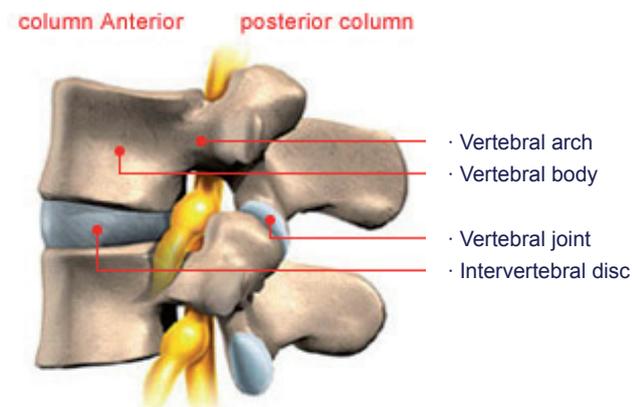
Osteochondrosis and spondylosis are secondary structural reactions and changes to the vertebral body caused by wear (degeneration) of the intervertebral disc.

### How do these changes come about?

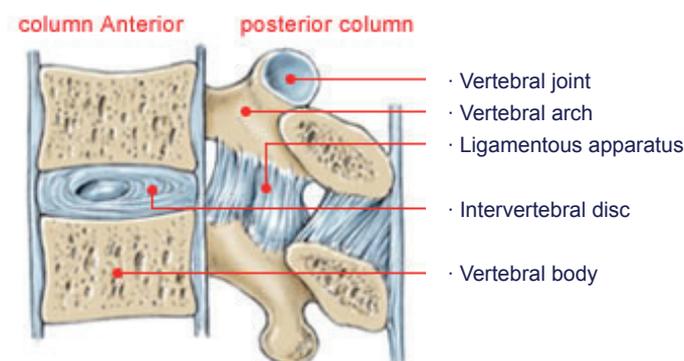
The mobile segment of the spinal column consists of two adjacent vertebral bodies, their vertebral arches and connecting joints, the intervertebral disc between them, and the complex ligamentous system connecting the vertebral bodies.

If we see the mobile segment as a double column, the vertebral bodies form the anterior column in static terms and the vertebral joints and arches form the posterior column. The healthy, elastic intervertebral disc dampens the forces acting upon these structures.

- Mobile segment of the spinal column

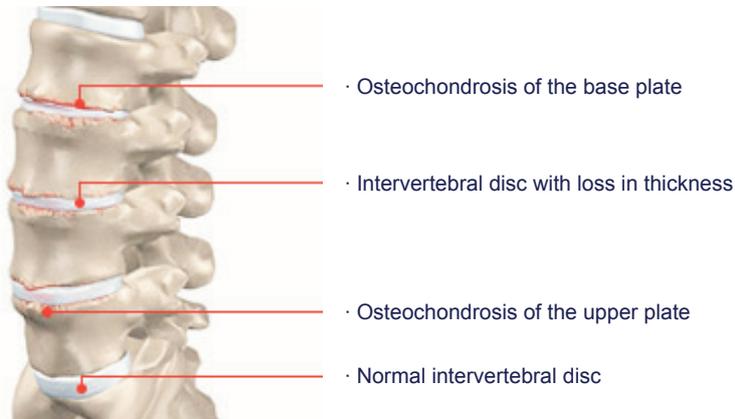


- Mobile segment of the spinal column, cross-sectional view



The intervertebral disc is subject to a natural aging process: it shrinks, loses its elasticity and grows thinner. This increasing loss in intervertebral space height results in morphological changes to the entire mobile segment. The degenerated intervertebral disc no longer elastically absorbs the applied forces, and pressure is increasingly shifted directly to the base and upper plates of the adjacent vertebral bodies. The first consequence of this increased pressure is an increase in bone mineral density (sclerosis) of the base and upper plates of the vertebral bodies, a condition called osteochondrosis or osteochondritis.

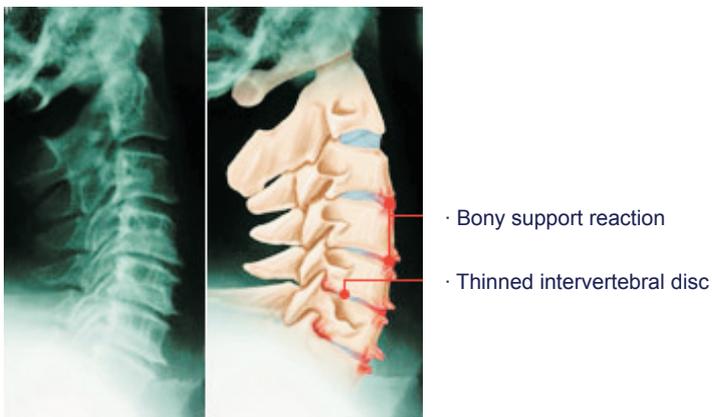
- Osteochondrosis of the lumbar spine with a loss in height of the intervertebral space and sclerosis of the base and upper plates.



The reduced thickness of the intervertebral disc alters the stability of the mobile segment. The changes in tensile and stretch stimuli and increasing amount of direct pressure on the end plates of the vertebral bodies results in progressive intervertebral disc degeneration. This results in the formation of new bony substance as added support. The new substance takes the form of a bony outgrowth at the edge of the vertebral body. This process of bony reformation of the vertebral body is known as spondylosis.

In pronounced spondylosis this support reaction of the vertebral bodies may be strong enough to actually create bony bridges between the vertebral bodies, a condition known as spondylosis hyperostotica.

- Osteochondrosis and spondylosis of the cervical spine. The intervertebral disc spaces grow thinner, base and cover plates are sclerosed, bony support reactions (outgrowths) are evident along the edges of the vertebral bodies.



### Where do osteochondrosis and spondylosis occur?

These changes can occur in every mobile segment of the spinal column. They are observed most frequently, and in the most pronounced form, in the lower cervical and lumbar spine, the spinal sections that bear the greatest mechanical loads.

**What are the symptoms of osteochondrosis and spondylosis?**

Although x-rays frequently show signs of osteochondrosis and spondylosis, these conditions do not result in symptoms requiring treatment in every case.

Depending on the location, neck and lower back pains occur and the involuntarily tensed muscles can hurt. Increasing instability of the mobile segment and increasing bony transformation of the vertebrae can result in a narrowing of the exit openings for the spinal nerves (foramina intervertebralia) and the spinal canal (spinal canal stenosis) with corresponding neurological symptoms.

**What therapy is recommended?**

Treatment always depends on the severity of the illness. The main therapeutic measures used in the initial phase are: physiotherapeutic measures to stabilize the mobile segments of the spinal column through the steady strengthening of muscles, adequate pain therapy, local injection treatments and accompanying physical treatment methods such as massages, heat applications, and electrotherapy.

Before recommending surgery to a patient, each case should be reviewed to see if minimally invasive interventional techniques can be used based on the specific findings and symptoms.

The following interventional methods can be used:

- IDET (Intradiscal electrothermal therapy)

This method is suitable for use on herniated discs that are causing back pain but not irritating or compressing the nerves.

Using radiographic monitoring, a special probe is introduced into the affected intervertebral disc. A controlled flow of heat is sent to the probe, causing a physicochemical reaction in the collagen fibers of the disc, resulting in shrinkage of its annulus fibrosus.

- Nucleoplasty

In this minimally invasive method, a special probe is introduced into the affected intervertebral disc under radiographic control. Using the coblation technique, thin layers of cells are obliterated by a plasma ion field generated around the tip of the probe. This is a gentle way of removing tissue, and the procedure shrinks the disc, thus reducing pain.

Surgery is indicated in cases where clinically relevant findings are corroborated by x-ray imaging and conservative therapy has been tried without success.

The possible surgical approaches include monosegmental or bisegmental decompression with fusion using either TLIF (transforaminal lumbar interbody fusion) or ALIF (anterior lumbar interbody fusion).