



**PARADIGM SPINE**

*the movement in spine care*

# Patient Information



**Cervical Disc Herniation**

**Dear Patient,**

This brochure is intended to inform you of possible treatment options for disc herniation in the cervical spine.

The information provided in this brochure is of general nature. It does not replace an informative briefing or an individual consultation given from a physician or spine specialist.

Functionally dynamic  
cervical stabilization  
with the **DCI**<sup>TM</sup> implant

**DCI**<sup>TM</sup>



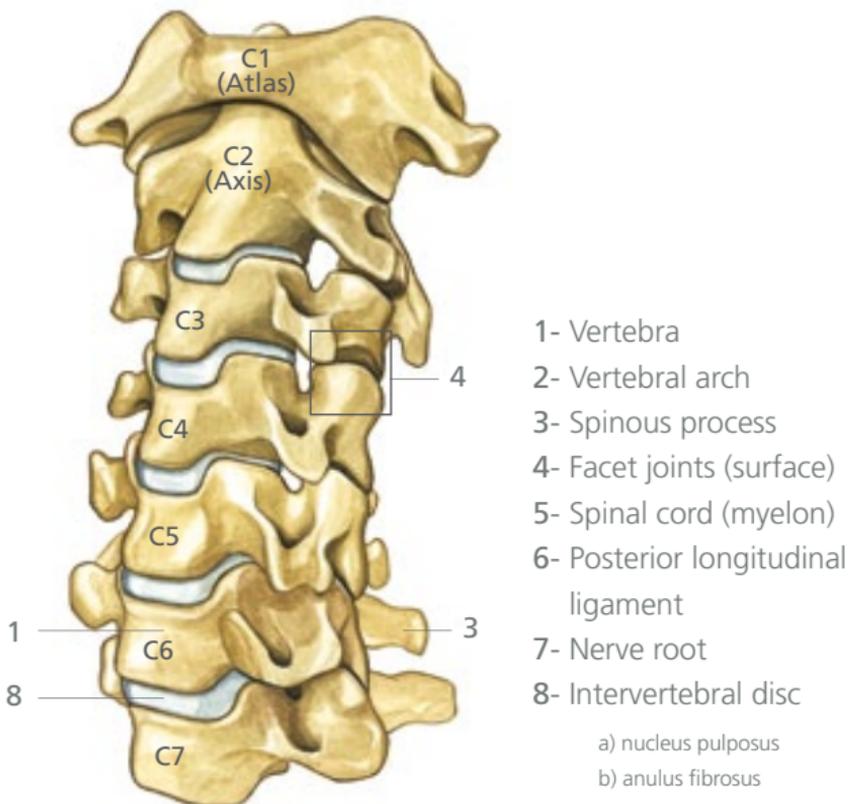
Dynamic Cervical Implant

# The Cervical Spine

## Stability of the cervical spine

The cervical spine is composed of seven vertebrae and is the most flexible part of the entire spine. The bony vertebral bodies and facet joints are subjected to significant loads. The fine movements of the cervical vertebrae are controlled by numerous muscles or muscle groups which are attached to the vertebral bodies.

The cervical spine muscles, in addition to controlling movement, have another very important function: the muscles are responsible for 80 % of the cervical spine stability. The bones, ligamentous apparatus and intervertebral discs on the other hand only contribute to the remaining 20 % of the stability.



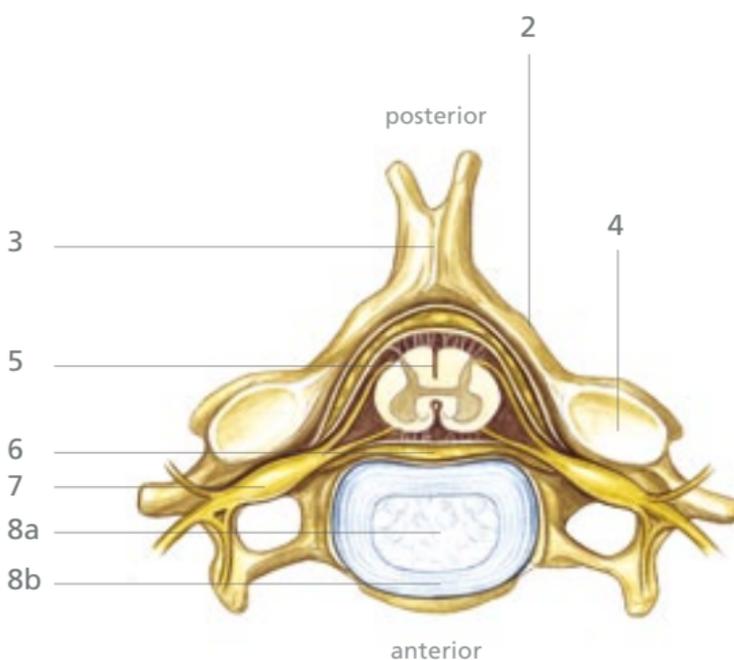
\* c = lat. cervix: neck

# Spine

## Intervertebral discs as shock absorbers

The intervertebral discs consist of a liquid-containing, gel-like cushion (nucleus pulposus) which is surrounded and kept “in shape” by a fibrous ring formed of tough connective tissue (anulus fibrosus). Each vertebra of the spine is separated from the next vertebra by an intervertebral disc (exception: cervical vertebrae 1 and 2). The functional unit “vertebra – intervertebral disc – next vertebra” is referred to as a mobile segment.

The larger the range of movement of such a mobile segment of the cervical spine, the higher the load on the intervertebral discs and the earlier degenerative changes may occur.



# Disc Herni

## Cervical Disc Herniation

### Disc herniation

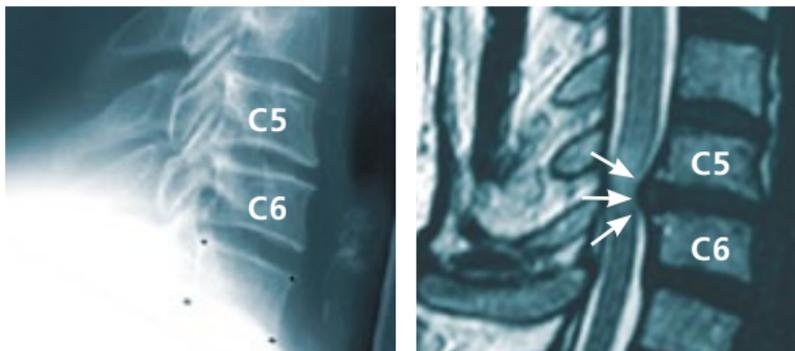
If the fibrous ring ruptures and discal tissue escapes, a disc herniation occurs (hernia, prolapse). The preliminary stage is known as the protrusion: here, the fibrous ring which is distended under the compression protrudes without tearing and discal tissue being displaced.

If the disc material is pushed into the spinal canal, individual nerve fibers may become irritated. If the disc herniation leads to the compression of a nerve root, tingling sensations, numbness and paralysis of the arms and hands may also occur, in addition to neck and arm pains.

If the symptoms can be alleviated by specific conservative methods of treatment (infiltrations, microtherapy), the surgical procedure can wait. However, if all conservative treatment options have been exhausted and the pains persist, surgery should be considered to restore the quality of life.

If a nerve root remains compressed or irritated for too long, permanent damage may occur. For this reason, it should be freed from the compression caused by the herniated disc as quickly as possible.

# ation



**Left:** in the x-ray image, the relatively minor “damage” to the intervertebral disc is visible. **Right:** in the magnetic resonance image, a large disc herniation is protruding rearward into the spinal canal between the 5th and 6th cervical vertebra.

## Therapeutic concepts

Since 1958 cervical fusion of vertebral bodies which are directly adjacent to the damaged disc has been continuously refined and carried out very successfully. Nowadays, spacers made of titanium or special types of plastic are used as a filler and enable simple and safe replacement of the disc. With cervical fusion, one of the mobile segments of the six-membered chain in the cervical spine is fused. As a result, the neighboring segments will be subjected to higher loads. This may lead to an accelerated degeneration of the adjacent segments.

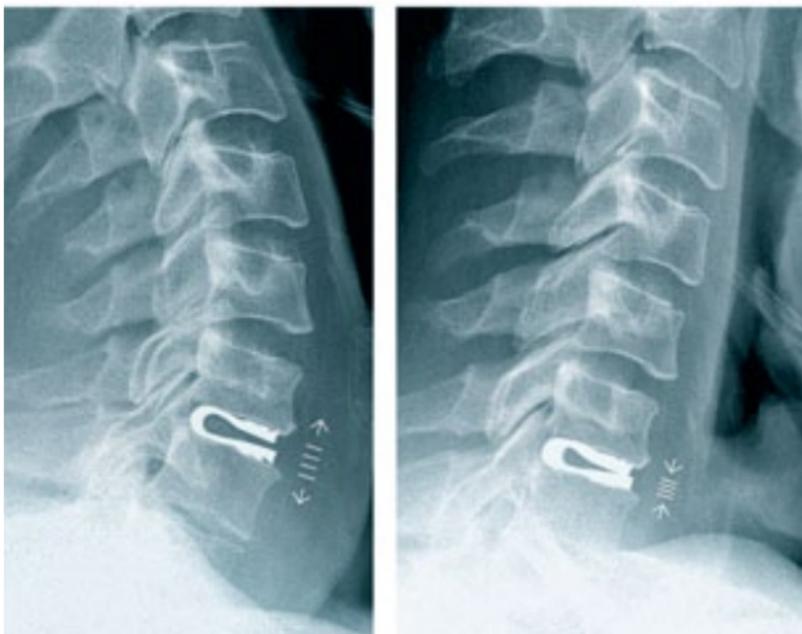
For this reason, flexible and dynamic implants have been developed. On one hand, the flexible disc prostheses for the cervical spine provide the advantage of full mobility, but on the other hand, there is the disadvantage that advanced degenerative processes or other contraindications could prohibit their use.

# Stabilizat

## Dynamic Cervical Stabiliz

### DCI™ - Dynamic Cervical Implant

The **DCI** implant for dynamic cervical stabilization bridges the gap between fusion and disc prosthesis. If a fusion is to be avoided and a disc prosthesis cannot be used, the **DCI** implant constitutes a functionally dynamic stabilization which retains part of the flexibility and slows the degeneration of the adjacent segments. The implant enables controlled movement of the operated segment and absorbs vertically applied forces such as those occurring at every step.



Shock absorbing capabilities of the DCI implant during movement

In the replacement of the damaged disc by a **DCI** implant, the main focus is on the following aspects:

- **Restoration of the disc height** to open up the nerve exit orifices and to protect the nerve structures and the facet joints.
- **Protection of the adjacent segments through shock absorption**  
The implant has shock absorption capabilities that provide effective protection against accelerated disc degeneration of the adjacent segments above and below the treated segment after implantation.

The **DCI** implant consists of a highly resistant titanium alloy. This proven implant material has been used for many years in endoprothetics and spinal surgery and is well tolerated by the body.



# Surgery

## The Surgery

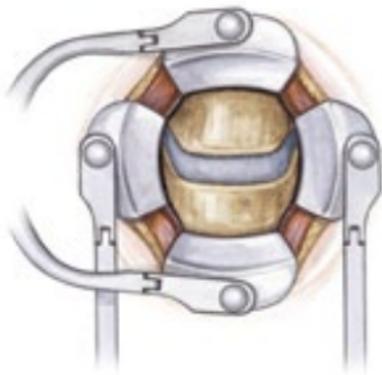
The surgical procedure is performed under general anesthesia. The affected segment is accurately located and the skin incision determined by x-ray examination.

Surgery consists of two steps:

1. Release the nerve structures from compression by the displaced disc matter.
2. Insertion of the implant.



The surgical procedure is performed in the supine position and very slight overextension of the head. The skin incision is made in a skin fold at the front of the neck.



Surgical access through natural tissue gaps is very tissue-friendly.

The damaged disc is removed under the surgical microscope.

## Decompression

The displaced disc material which is the reason for the nerve root irritation is removed. This “decompression” – as it is known – of the nerve root and the spinal canal is the most important step in alleviating the symptoms.

## Insertion of the implant

Once the decompression has been performed, the surgeon selects a suitable implant size. The maximum contact surface and height are determined by a trial implant.

The **DCI** implant is implanted in the intervertebral space with an implant insertion instrument under the microscope.



The final implant position is optimally adjusted under x-ray control.

# Surgery

## The Surgery

### **Adverse reactions and complications**

The chances of successful cervical spine surgery with long-term symptom relief are excellent. Complications that may occur during intervertebral disc removal are extremely rare. However, it should be pointed out that such an operation may lead to compression damage of the vocal chord nerves since these are located directly in front of the spine. Transient but also lasting hoarseness may result. Unpleasant swallowing difficulties may be experienced in the first few days after surgery. These will generally subside within a few days. Direct damage to a nerve or the spinal chord itself unfortunately can never be excluded completely but is extremely rare as a result of the surgery being performed under the microscope by experienced surgical teams.

### **What happens after surgery?**

The pain medication doses can be reduced already after a few days. In the first few days after surgery, gentle stroking, loosening massages and heat will help alleviate the pains resembling muscle soreness in the neck. These pains may be caused by the extension of the cervical spine during the operation.

The implant can immediately be subjected to handle loads; however, extensive exertion should be avoided in the first 6 weeks following a surgery.

Physiotherapeutic exercises will be individually prescribed.



Final status after implantation – lateral view



**DCI**™



Dynamic Cervical Implant

Controlled motion, functionally dynamic  
[www.paradigmspine.com](http://www.paradigmspine.com)



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