

## THE LUMBAR SPINE (BACK)

### At a glance

Chronic back pain, especially in the area of the lumbar spine (lower back), is a widespread condition. It can be assumed that 75 % of all people have it sometimes or all the time. In Germany, it is the second most diagnosed condition in visits to the orthopedist and the third most common in general practice. Other European countries report comparable figures.

In the following pages, we will describe the most important clinical pictures of lumbar spine problems, which manifest in a wide variety and are often difficult to diagnose. Our objective is to familiarize you with the important definitions associated with the spinal column as an aid for a deeper conversation with the physician or as a general introduction to this topic.

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### 1. Introduction

The spinal column is the human backbone, providing stability to the trunk (torso). Its individual sections allow a varied range of movement, which will be described in more detail below. We will focus here on degenerative diseases of the lumbar spine and deliberately exclude injuries and congenital malformations.

As with all other joints and organ systems, the spinal column is subject to normal age-related processes; however, strain or overload, physical inactivity and obesity accelerate these processes. In addition, psychological factors such as stress, for example, cause bad posture and muscular tension.



### 2. Anatomy and physiology

The lumbar spine consists of five lumbar vertebrae. There are elastic intervertebral discs between each vertebra that allow the vertebrae to move while also acting as springs and shock absorbers.

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Bony processes keep the lumbar vertebrae in close contact with each other. Their contact surfaces have a cartilaginous layer, allowing them to function as joints. The nerve roots extend through nerve root canals located between the lumbar vertebrae.

The lumbar spine allows the trunk to bend, stretch and tilt sideways. Longitudinal turning on an axis (rotation) is limited, as this kind of movement is done in the thoracic and cervical spine area. Owing to the load that they have to support, the lumbar vertebrae are by far the largest of the entire spinal column.

**The vertebrae are held together by a system of ligaments, muscles control both the unconscious and active, conscious movements**

On the back side of the nerve roots, the neural or vertebral arches form a canal that encloses the spinal nerves which exit through the intervertebral foramina. These nerves control the trunk muscles and the limbs.

Additionally, the vertebrae are held together by a powerful system of ligaments. Muscles attached to various points along the spinal column control both the unconscious stabilization of the torso as well as active, conscious movements.

### **3. Pain syndromes of the lumbar spine (lower back pain, lumbago, lumbar sciatica, lumbar pain)**

#### **1.Cause(s)**

Age-related wear and tear processes cause most of the problems in the lumbar region. The intervertebral disks lose elasticity and become flatter. Therefore, the space between the individual vertebrae decreases; over the long term, this causes wear and tear on the intervertebral joints (spondyloarthritis) and a narrowing of the nerve root canals. Protrusions in the spinal canal form as well.

Any or all of these changes lead to painful nerve root irritations and painful back muscle tension. Often, such symptoms are triggered by bad posture, lifting heavy loads, or other physical activities (gardening or moving furniture, for example). Finally, psychological stress and strain can also contribute to lumbar pain.

#### **2. Clinical aspects/ Symptoms/Diagnosis**

Painful, tense muscles on either side of the spine are typical. Sometimes the pain will radiate towards the buttocks and the upper leg – the term “lumbago” is used if the pain is sharp and sudden.

An X-ray of the lumbar spine may rule out serious changes in the vertebrae.

In young and middle-aged patients, X-rays often fail to show any anatomical changes, creating a discrepancy between the X-ray reading and the patient’s symptoms. X-rays of older patients

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are more likely to show changes in the vertebrae (flattened shape, wedge shape or formation of jagged edges (spondylophytes), all signs of osteoarthritis. If there are neurological symptoms such as tingling, paresthesia or even paralysis in the legs, further diagnostics such as a CT or MRI scan should be used to find a possible herniated disk, though most herniated discs are not symptomatic. Electodiagnosis (EMG) can be used to detect nerve damage.

## **Both strong painkillers and bed rest help relieve pain during an acute attack**

To relieve pain during an acute attack, patients should take painkillers as ordered by their physician. Physical therapy, heat, ice or rest can help relieve pain.

Avoid any unusual strain on the spine, focus on moving and holding the spine properly during everyday activities and follow advice given by physicians. Office workers should not remain glued to the chair all day, but instead get up and change positions frequently. Movement is essential.

Last but not least: If psychological stress could be a factor, the measures outlined above will provide little or no relief. For those cases, useful relaxation techniques and even psychotherapy could help.

## **4. The herniated disk**

### **1.Cause(s)**

Wear and tear processes in the intervertebral disks can lead to this condition. The outer fiber rings tear, allowing the core of the intervertebral disk to protrude and this can irritate or compress the spinal nerves. Herniated disks are often caused by improper stress on the spine, poor lifting technique, and obesity.

### **2. Clinical aspects/ Symptoms/Diagnosis**

Generally, the patient has had back pain for a long time; the herniated disk occurs following excessive lifting or an unaccustomed rotating movement.

## **Neurological disorders such as paresthesia and weakness occur with a time delay**

The back muscles can be extremely tense and painful during an attack, and movement is difficult; patients assume a noticeable protective posture. Pain can radiate toward the buttocks and legs.

Sometimes, neurological disorders such as paresthesia and weakness occur suddenly, but most of the time they are delayed. An X-ray of the lumbar spine may help to rule out serious changes in the vertebrae. If there are clinical indications of a herniated disk,

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such as paresthesia or weakness in the legs (difficulty in raising the foot for example), further diagnostics should be attempted. Electrodiagnosis (EMG) can detect nerve damage. CT and MRI scans allow the physician to assess the condition of the intervertebral discs.

### 3. Therapy essentials

Pain relief must be the first priority. Patients should take antirheumatoid agents and muscle relaxants as prescribed by their physician. They should not exacerbate spinal irritation during an acute attack.

Once the acute symptoms have subsided, physical therapy may be necessary. Elastic back bandages can be a part of rehabilitation.

If the previously described treatments fail to relieve neurological symptoms, surgery may be necessary. Many different procedures are available, depending on the type and location of the herniated disk, but due to space constraints we cannot describe them in detail here. Only an expert can objectively decide on a case-by-case basis whether surgery is necessary and likely to help the patient.

### 5. How do FUTURO™ Back Supports work?

Thanks to their elasticity and ability to conform to the body's shape, FUTURO back supports hug the torso and the lumbar spine's curves, providing heat, which aids treatment. They also support the patient's compromised lumbar spine and hinder extreme movements.

People often fear that these types of back supports will further weaken the back muscles, but new research has demonstrated that this is not the case.

## THE CERVICAL SPINE (NECK)

### At a glance

In the following pages, we will describe the most important clinical pictures of the cervical spine. Our objective is to familiarize you with the important definitions associated with the spinal column as an aid for a deeper conversation with the physician or as a general introduction to this topic.

### 1. Introduction

The spinal column is the human backbone, providing stability to the trunk (torso). Its individual sections allow a varied range of movement, which will be described in more detail below. We will focus here on degenerative diseases of the cervical spine and deliberately exclude injuries and congenital malformations.

As with all other joints and organ systems, the spinal column is subject to normal age-related processes, but strain or overload leads to painful changes as well. In addition, psychological factors such as stress, for example, cause bad posture and muscular tension.

### 2. Anatomy and physiology

The cervical spine consists of seven cervical bodies or vertebrae. There are elastic intervertebral discs between each vertebra that allow the cervical bodies to move while also acting as springs and shock absorbers.

Bony processes keep the cervical vertebrae in close contact with each other. Their contact surfaces have a cartilaginous layer, allowing them to function as joints. The nerves that control the neck and arms protrude through the intervertebral foramina located between the individual vertebrae. There are also foramina in the lateral transverse processes so an artery leading to the brain can pass through them.

Additionally, the vertebrae are held together by a powerful system of ligaments. Muscles attached to various points along the spinal column control both the unconscious stabilization of the torso as well as the active, conscious movement.



**Due to its anatomical conditions and the intensity and wide range of motion, the cervical spine is prone to disorders**

A normal, undamaged cervical spine allows a wide range of movement – rotation to the left and right, bending forward and to the sides, and stretching backwards as well.

Because so many bones, ligaments, and vertebrae are packed in such a little space – especially in the cervical region – and because of the sheer number and intensity of movements it undergoes, the cervical spine is prone to a great deal of premature wear and tear.

## 1.Cause(s)

### **3. Pain syndromes of the cervical spine (neck pain, cervical syndrome, cervicobrachial syndrome, shoulder-arm syndrome)**

Pathological constrictions of the intervertebral foramina, compression of the intervertebral disks, and osteoarthritis of the cervical joints are especially problematic. This may result in compression of nerve roots, but the arteries that lead to the brain can also become narrowed, a condition known as vertebral artery syndrome.

Changes in the intervertebral disks, such as the common herniated disk, also play a role. Here, the fiber rings of the disc tears, allowing the core of the intervertebral disk to protrude and press on the spinal cord or the nerve roots.

## 2. Clinical aspects/ Symptoms/Diagnosis

Pain occurs in the neck muscle area, which is tense and hard; the head can only be slightly moved or tilted sideways; the neck is stiff. Changes in the intervertebral foramina cause irritation or even compression of the nerve roots located along them, so that pain can radiate toward the arms and shoulder. This may cause paresthesia (a prickly, tingly, or creepy-crawly sensation) or weakness in the arms and hands.

The pain can also radiate toward the back of the head. If the cerebral arteries become constricted, dizziness, ringing in the ears, impaired vision, etc. may occur. X-rays of the cervical spine with additional pictures of the intervertebral foramina or the vessels will generally explain the symptoms. MRI and CT scans will show the condition of the intervertebral disks.

## 3. Therapy essentials

Most of the time, intensive physical therapy that includes massage of the neck muscles and local heat applications will provide fast relief. In the acute stage, rheumatoid painkillers and muscle relaxants to eliminate pain as quickly as possible are also recommended.

So-called neck collars or supports that restrict painful movements while providing heat can have a supportive effect.

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If these treatments prove unsuccessful, then injections or surgery may be needed. After critically examining the condition, the orthopaedic specialist must decide whether an operation is necessary or not.

If there are no detectable anatomical changes, and all measures outlined above are unsuccessful, there are still specific relaxation exercises that patients can benefit from to provide some relief from pain.

## 4. How do FUTURO™ Neck Supports work?

Thanks to their ability to fit any part of the patient's anatomy and the elasticity of the material, FUTURO supports take the shape of the anatomical contours very well. They exert a slight compression on the affected painful parts of the joint and provide some warmth, which helps relieve muscle tension.



Developed in collaboration with a panel of specialized physicians and medical therapists.

Learn More about FUTURO™ Back and Neck Supports, [CLICK HERE](#)