For A Pain-Free Future

Avicenna Clinic

The International Spinal Clinic You Can Trust In Berlin

> “Understand the pain to alleviate it!”

EDITORIAL

Dear readers,

Back pain is a very common condition that sooner or later will affect almost everybody. For this reason, I am extremely honoured to present you our new clinic brochure entirely focused on the spine. This brochure also provides an informative guide to clarify all your questions about back health. We will also use the pages of this brochure to introduce you our clinic in more detail, by offering you some fascinating insights into our work and the treatments we use.

In order to treat back problems effectively, it is necessary to reach an accurate diagnosis. This means we not only take the time to carry out an in-depth consultation with you, but we also use a range of state-of-the-art technical equipment to pinpoint the exact causes of your symptoms. Our different diagnostic methods are explained in detail on page 10.

Nearly everybody is familiar with the term “slipped disc” but it is important to know that back pain can also be caused by other conditions. Few people may ever have heard of many of them. This is why, on pages 12–23, we have listed various conditions that can affect the spine.

Your health is our utmost priority – we want you to live your life free from pain. To offer you the best possible treatment, we use a range of modern therapies. More detailed information on the individual treatment methods can be found on pages 24–31.

I hope you enjoy the reading!
Yours,

Dr. Muntlier Sabarini

Dr. med. M. Sabarini (Neurosurgeon)
Director of the Avicenna Clinic Berlin

CONTENTS

FOCUS ON HEALTH

Why Avicenna Clinic?

Our Dedication to Your Well-Being

The Avicenna Clinic is an internationally renowned clinic specialised in spinal surgery. Our experience and membership with numerous international and German organisations relating to spinal surgery, neurosurgery and pain therapy highlights our commitment to deliver medical care of the highest quality.

Personal and Professional

Your well-being and health are at the forefront of everything we do. We want you to feel happy with us, which is why we respect your personal beliefs, traditions and religion. If you have any questions, our team is always available to assist you with medical expertise and empathy. Even if previously you have been told there is no prospect of improvement, we take the time to carry out a detailed consultation in order to discuss the way forward.

Combined Expertise

We provide diagnosis, treatment, aftercare and prevention services all under one roof. This is how we safeguard the best possible medical care for you. Our experienced consultants will draw up a treatment plan that has been coordinated perfectly with your diagnosis, the aim of it being to alleviate your symptoms and to restore your quality of life. Thanks to an interdisciplinary collaboration between specialists, suitable therapies are started as quickly as possible.

Gentle and Innovative

To ensure effective treatment, we pursue a holistic concept. Our internationally renowned consultants work hand in hand with trained staff as part of this. For procedures that are especially gentle for patients, we use innovative treatment methods such as laser therapy and minimally invasive techniques. We monitor medical research worldwide giving you the chance to always benefit from the latest medical findings.

Ultra-Modern Facilities

Our diagnosis and treatment facilities are state-of-the-art. In order to make you feel comfortable and happy during your stay with us, we welcome you in our extremely cosy, bright and modern rooms.

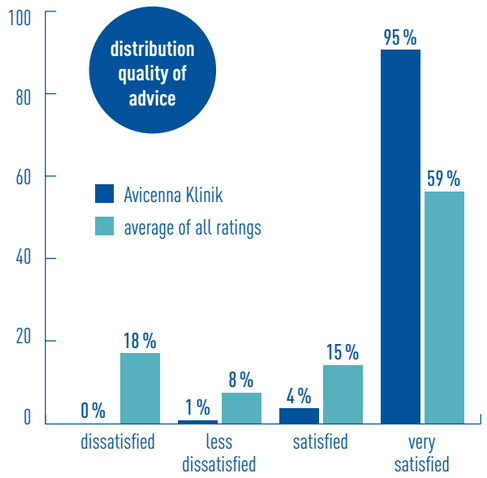
Internationally Renowned

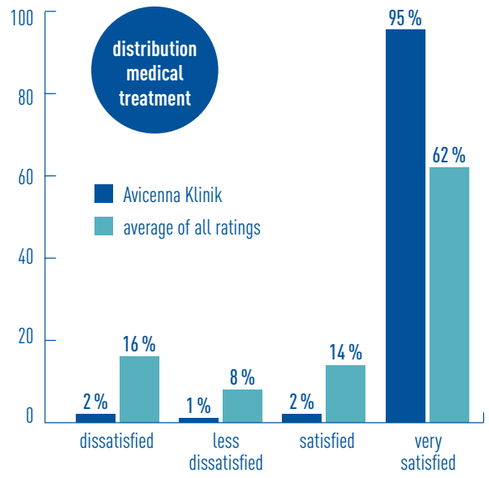
Patients come to our clinic from all over the world. To ensure that they feel well we provide them with a team which speaks multilingual languages: English, French, Spanish, Arabic, Russian, Turkish, Polish and others.

OUR PATIENTS' SATISFACTION

The following charts show you the quality patients' experiences with us.

So that you know what the experiences of patients who have been treated at our clinic have been like, you will find charts on this page showing their ratings of the Avicenna Clinic. They show how our clinic is rated by patients compared to around 3,000 other hospitals across the whole of Germany.





Excerpt from our treatment outcomes

Since 2001, we have treated around 20.000 patients. The following adverse health events occurred:

Complications following spinal procedures	Occurrence in per cent
Blood clot	0,0
Pulmonary embolism	0,0
Organ injuries	0,0
Post-operative symptoms of paralysis	0,0
Complications relating to anaesthesia	0,0
Bleeding	0,005
Delayed wound healing	0,005
Neurological deficits	0,005

Source: klinikbewertungen.de

The spine is the central axial organ of the human body and allows us to walk upright. Every day, it needs to withstand extreme stresses since, as a supportive framework, it performs not only static duties but also allows movement of the body in three planes: flexion and extension, sideways movement and rotation around the longitudinal axis.

THE MARVEL THAT IS THE SPINE

Anatomy of The Spine

Double S-Shape

Seen from the behind and front side, a healthy spine – formed by vertebrae, disks and ligaments – appears straight. From the sides, however, it has a double S-shape that ensures balance while walking and helps to cushion impacts. The spine can be divided up into various sections.

Cervical Spine (C Spine)

The most mobile part of the spine is made up of seven cervical vertebrae. It is particularly sensitive, which is why adverse stress can quickly cause muscle tension and signs of wear and tear within the area. Alongside symptoms in the affected region, pain that radiates to the head and arms can also often occur. Dizziness, feelings of numbness and Tinnitus can also number among the symptoms.

Thoracic Spine (T Spine)

Twelve thoracic vertebrae form the most immobile part of the spine. Protected by ribs and the ribcage, the T spine is relatively rigid.

Lumbar Spine (L Spine)

The lower part of the back is made up of five lumbar vertebrae. The greatest weight is placed on the L spine area, which is why symptoms occur particularly frequently there. At the end of the spine, there are 5 fused sacral vertebrae and 4–5 fused coccygeal bones.

Sensitive System

Bones and tissue of the back together form a complex system in which every element has an individual task to carry out. Yet even the smallest problems can cause difficulties due to the system`s sensitive nature. As a result, this causes back symptoms and radiating pain. Well-trained trunk muscles are the most effective protection against pain. Regular exercise and targeted training should, therefore, be on the schedule for a healthy back.

Since there are many causes of back symptoms, a detailed diagnosis is crucial for a successful treatment. Doctors differentiate between non-specific and specific symptoms. While non-specific symptoms are generally caused by tension or adverse stress, specific symptoms are caused by a disease process. In order to offer you comprehensive advices and successful treatments, we first need to find out what is causing your pain. In addition to detailed consultations with patients and physical examinations, we also use imaging technologies. Our clinic has state-of-the-art technical equipment that offers superlative comfort and safety. Our experienced team will look after you throughout the entire procedure. Paying attention to your general health condition, we will carefully analyse your findings and draw up a personalised treatment plan.

PINPOINTING SYMPTOMS – DIAGNOSTIC METHODS

Modern Methods Facilitate Reliable Diagnoses

Open MRI Scanner

Using magnetic fields, the MRI scanner produces comprehensive, high-resolution sectional images of the body, allowing precise visualisation of its anatomical structures. This means that even the tiniest of changes can be spotted. The procedure uses no radiation and is therefore completely harmless. To ensure your comfort as much as possible, our clinic disposes of an open MRI scanner.

Bone Density Measurement

This method is used if there is a suspicion of osteoporosis or thinning of the bones. The principle behind this screening method is based on radiation which penetrates the bones. Depending on their density, the irradiated bones absorb the rays to varying degrees, allowing conclusions to be drawn regarding their mineral salt content and therefore their stability.

Electrophysiology

Electrophysiology includes Electromyography (EMG), Nerve Conduction Study (NCS) and Evoked Potentials (EP), among other parameters. These neurological investigations provide us with a wealth of information regarding functional changes to the peripheral nerves and spinal cord function.

Digital X-Rays

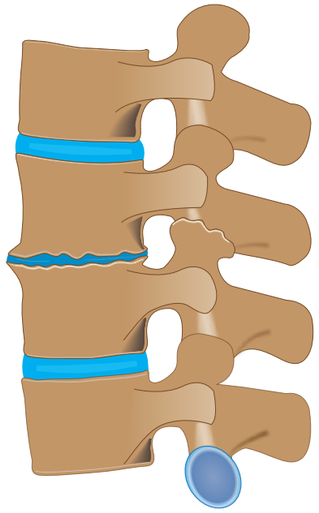
X-ray techniques are used if there is suspected disease affecting the bones of the spine, such as fractures, dislocation or signs of wear and tear. During the imaging procedure, you will stand, sit or lie in front of the X-ray machine for only a few seconds. The images are then immediately available, so we are able to discuss the results with you straight away and to minimize the waiting time until the start of your treatment.

CONDITIONS AFFECTING THE INTERVERTEBRAL DISCS

The Most Common Conditions

If pain in the back is also accompanied by pain radiating to the legs or arms, the cause is often intervertebral disc disease.

Every human has twenty-three intervertebral discs. They act as shock absorbers between the vertebrae, cushioning and distributing weight and pressure. They withstand enormous forces on an everyday basis. Each intervertebral disc has nearly the same structure: a solid, fibrous ring (annulus fibrous), which surrounds a jelly-like core, also known as the nucleus. The core is 90% fluid. These natural buffers are different sizes, depending on which part of the spine they are located in; the discs in the cervical and thoracic spine are smaller than those in the lumbar spine. To ensure they remain elastic, they need to have a supply of nutrients. However, they do not have their own blood vessels. Instead, they receive the nutrients they need via the vessels in the vertebrae. During stress, they give out nutritional fluid and when relaxed, for example, while you are lying down, they reabsorb it, acting effectively like a sponge. This also explains why people can shrink by up to three centimetres over the course of the day. Over the course of our lives, our bodies are subject to a natural wear and tear process and conditions such as intervertebral disc degeneration, bulging or even slipping can occur. The symptoms that sufferers experience depend on the severity of the problem and its localisation. Essentially, if nerves are pressured, it is necessary the immediate intervention of a specialist, otherwise, nerves run the risk of being permanently damaged. The loss of function of a natural shock absorber also increases the strain on surrounding discs and spinal joints. Personalised treatment will help to prevent consequential damage. Depending on the extent of the disease, we can offer an extensive array of treatment options – from medication and physical methods such as injections and heat and cold treatments to innovative, minimally invasive procedures.

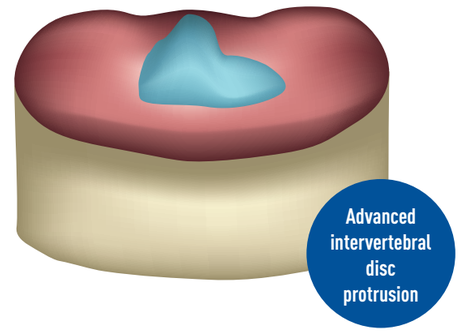


Intervertebral Disc Bulging (Protrusion)

Intervertebral disc bulging, also known as disc protrusion, represents the preliminary stage of a slipped disc. In this case, the fibrous ring slips over the edge of the vertebral body without any of the jelly-like core leaking out of it. Patients with this condition experience pain in the cervical or lumbar spine. Not uncommonly, radiating symptoms are experienced in the arms or legs too. Other symptoms such as tingling, numbness or even reduced power may also occur. Minimally invasive methods can effectively alleviate these symptoms.

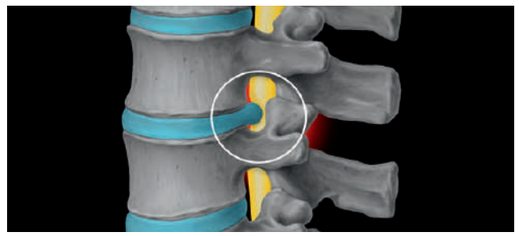
Intervertebral Disc Degeneration

Over the course of our lives, the gel cushions undergo a natural ageing process, which causes them to lose their elasticity and volume. The disc loses height, becomes brittle and therefore loses its function as a natural buffer. The medical term for this is intervertebral disc degeneration or wear. A lack of exercise or being overweight can increase the appearances of wear and tear because the gel cushions are receiving too few nutrients due to their constant strain. The onset of degeneration is usually not associated with severe symptoms. These usually occur only once the disc has bulged or slipped. To avoid the wear and tear from deteriorating or even causing consequential damage, it is a good idea to have even mild back symptoms investigated. Often, targeted conservative treatments can help to slow down the degeneration process and alleviate symptoms.



Slipped Disc

If water content and therefore the elasticity of the intervertebral disc diminish, the fibrous ring becomes cracked and fissured, allowing the jelly-like core to break through the fibrous ring and causing a slipped disc, also known as disc prolapse. If the core leaks out of its ring, it can press on the surrounding nerves or spinal cord and, for sufferers, can result in severe pain in many cases. A slipped disc occurs commonly in the cervical or lumbar spine since it is here that the physical stresses are greatest. In case of prolapse in the lumbar spine, the pain usually occurs in the lower back area and radiating symptoms or numbness are experienced in the legs and buttocks. Prolapse of a vertebral disc in the cervical spine, on the other hand, is often associated with neck pain and numbness of the arms and hands, but also headache, dizziness and tinnitus, while concentration, balance or even visual disturbances are also possible symptoms. In many cases, micro-surgical treatment can provide a safe and definitive resolution.



When pain lasts for several months or longer than normal, doctors define it as chronic pain. Although the causes of this pain in most cases have already been treated or resolved, the pain persists or keeps coming back. In addition to severe wear and tear of the spine, symptoms of polyneuropathy, circulatory disorders, inflammation or injury can also cause chronic pain.

CHRONIC PAIN

When The Pain Won't Go Away

Post-Nucleotomy Syndrome

If pain recurs following a "successful" operation on the spine, doctors consider it as a post-nucleotomy syndrome. These symptoms are often similar to those presented before the operation. The potential causes include severe slipped discs or absolute spinal canal narrowing, which caused severe damage to the neural structures even before the operation. Late performance of essential surgery or inadequate post-operative psycho-social course can also lead to the post-nucleotomy syndrome. This condition is rare but it could have a considerable impact on sufferers´ quality of life. This condition can be alleviated with Denervation or spinal cord stimulation.

Polyneuropathy

Polyneuropathy refers to damage to the peripheral nervous system, i.e. the nerves outside the brain and spinal cord. Diabetes especially, but also heavy alcohol consumption, inflammation, injury, radiation and chemotherapy can also cause polyneuropathy. Sufferers experience constant pain in the legs or arms, accompanied by symptoms of tingling, cold, restlessness or twitching. Alongside conservative treatments such as medication or physiotherapy, the use of a pain pacemaker for spinal cord stimulation has proven to be especially effective.

Complex Regional Pain Syndrome

With this condition, also known as Sudeck's atrophy, pain that cannot be attributed to the original cause, but occurs mainly following injuries or surgery for example on hand, arm, foot, hip, shoulder or knee joint. The condition is manifested through changes in physical perception, hypersensitivity to touch, severe pain, a restricted range of movement and fluid accumulation in the affected parts of the body. To achieve pain relief, we offer conservative pain therapy or Spinal cord stimulation.

Facet joint arthrosis often occurs in the context of wear and tear of the entire section of the spine or as an independent condition. Wear and tear of the facet joints cannot be reversed.

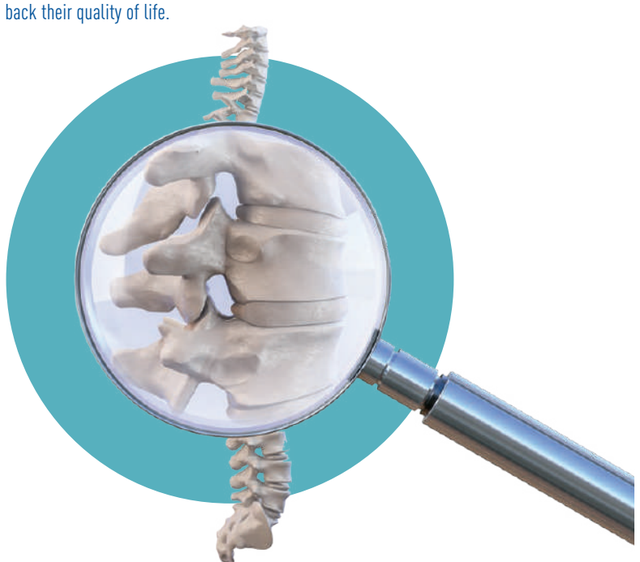
WHEN THE SPINE AGES

Facet Joint Syndrome – Arthrosis of The Vertebral Joints

A vertebra is made up of a vertebral body, vertebral arch, spinal canal and the spinal, transverse and articular processes. Together, the vertebral body and arch enclose the spinal canal, through which the spinal cord runs. Between two independent vertebrae, there is an intervertebral disc, which acts as a shock absorber. Only the first and second cervical vertebrae do not have this disc. Between the articular processes of two neighbouring vertebrae are placed the zygapophyseal joints, also known as the vertebral or facet joints. The articular processes are covered with a thin layer of cartilage and enclosed by a joint capsule.

As we age, the cartilage's ability to regenerate diminishes losing its elasticity and reducing the cartilage substance. As a result of degeneration, the disc volume is also reduced, decreasing the distance between the vertebrae. This would cause abnormal stress on the facet joints, which can – in turn – cause osteoarthrosis. Doctors also refer to this condition as facet joint syndrome and it can occur in the cervical, thoracic and lumbar spine. Sufferers often experience very severe, deep-seated back pain when the joints are stressed.

Depending on the severity of the symptoms, we offer various treatment options to exert a positive influence on the condition's progress. We are achieving good successes with denervation. This relieves pain and gives patients back their quality of life.

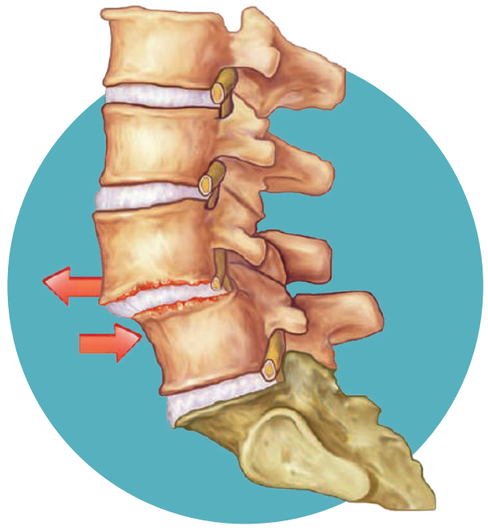


INSTABILITY OF THE SPINE

When Vertebral Bodies Slip Out of Line

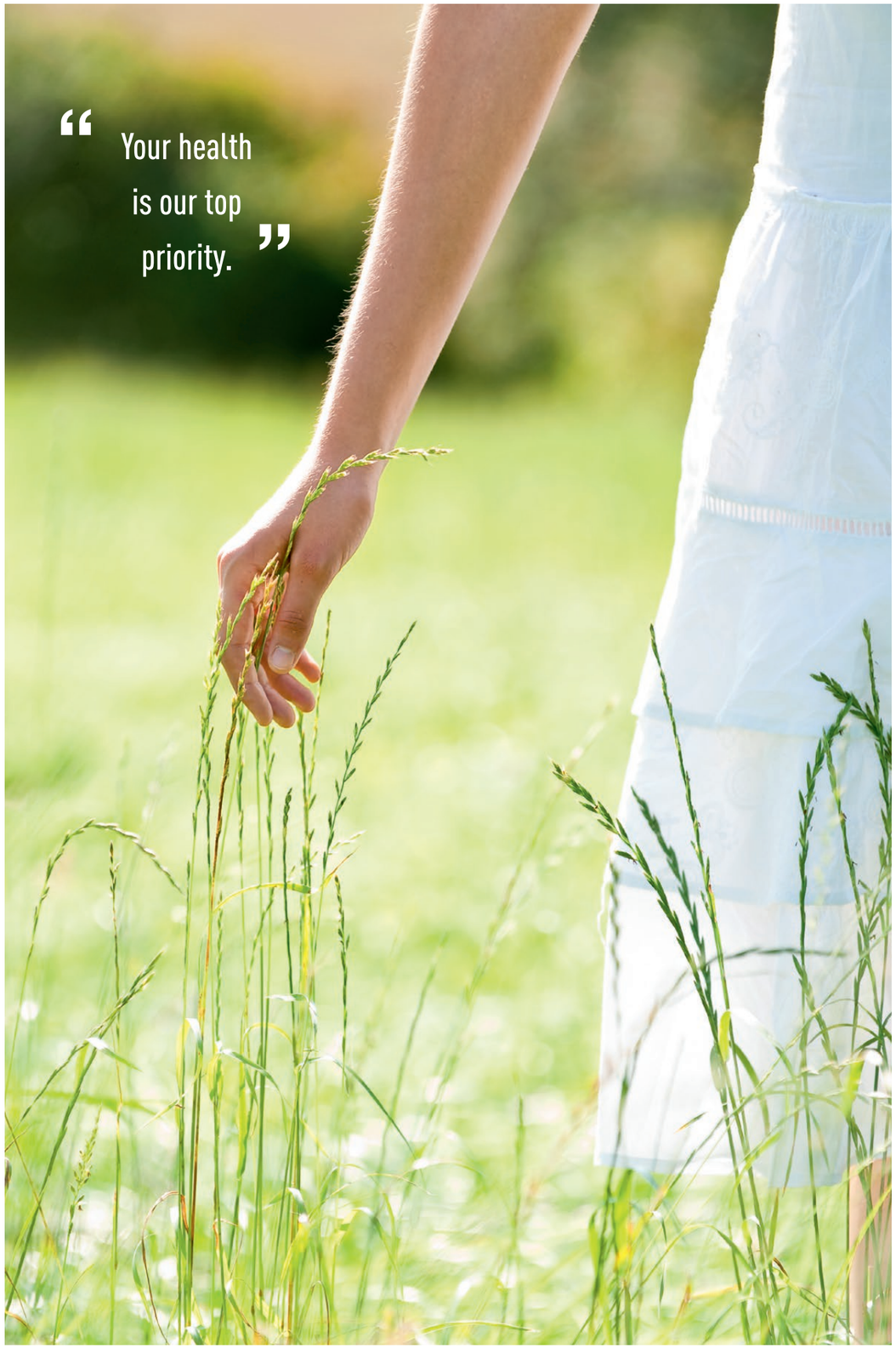
Spinal Instability

Together with the intervertebral disc, two vertebral bodies form a so-called motion segment which at the same time is held together by tendons, muscles, ligaments and joints. Over time, appearances of wear and tear in the disc and spinal gliding joints result in loss of the spine's stability. Acute injuries, muscle weakness, repeated operations on the spine and chronic adverse mechanical stress can trigger this. With spinal instability, the amount of movement between the motion segments increases. This results in a disrupted transfer of forces along the spine which, over the long term, leads to misalignment and therefore pain. Depending on where the instability is, this can occur in various regions of the spine. If the displaced vertebra also impinges on a nerve, this can cause radiating pain. Treatment is customised to the cause of the instability and ranges from conservative measures including intervertebral disc cultivation and kyphoplasty to spondylodesis.



Spondylolisthesis

Spondylolisthesis is the most common form of spinal instability. With this condition, the vertebrae slide over each other due to the weakness of the surrounding structures. This sliding movement can occur forwards or backwards and most commonly occurs in the lumbar region. Athletes especially, who frequently hyper-extend their joints, can suffer from these conditions. Ageing processes and repeated spinal operations can also cause injuries to the vertebrae and make them slide around. Sufferers frequently complain of pain radiating to the legs. Later on, altered sensation, reduced power or even bladder-function disturbances can develop. Whereas conservative treatment is usually sufficient for mild cases, where there is severe spondylolisthesis surgical stabilisation of the vertebrae is required to reconstruct the natural shape of the spine.

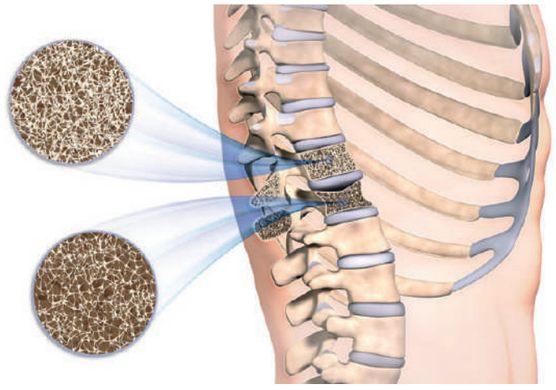


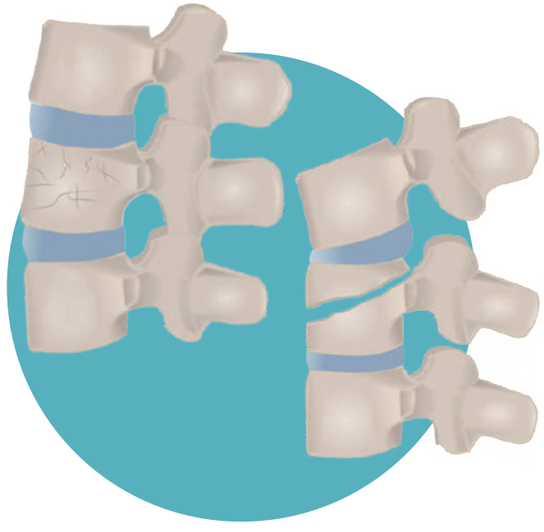
VULNERABLE SPINES

When Bones Structures Are Involved and Vertebrae Break

Osteoporosis

Over time, bone metabolism diminishes. With osteoporosis, the body builds up significantly less bone substance than it removes, with the result that bones lose solidity and stability. The process usually occurs insidiously. The triggers of osteoporosis include calcium and vitamin D deficiency, hormonal disorders and a lack of exercise. Post-menopausal women are particularly affected since their bone density diminishes markedly due to falling oestrogen levels. The result is porous bones which, as the condition progresses, can lead to fractures in the spine. If osteoporosis remains untreated, patients can experience severe back pain, lose height and develop a forwards-stooping gait over time. Although the condition cannot be cured, conservative therapies and minimally invasive procedures can alleviate the symptoms.





Vertebral Fractures

The spine carries the majority of our weight and, when healthy, is very stable. A vertebral fracture therefore only occurs rarely, for example following the impact of a powerful outside force such as an accident or fall. Spinal joint fractures not only cause instability of the entire spine, but they can also lead to injuries to surrounding structures such as the spinal cord. If osteoporosis is present, there is a risk of spinal fractures even without any recognisable external influence since the density of the spinal bones is decreased. As the condition advances, the spine can no longer support the weight of the body. Alongside trauma and osteoporosis, other conditions such as cancer and metastases, inflammation or ankylosing spondylitis can also cause fractures. Depending on the exact diagnosis, there are various treatments available for treating a spinal fracture, starting with minimally invasive cementing and progressing to reinforcement surgery and ultimately vertebral replacement. A combination of more than one procedure is also an option.

The spinal canal, also known as the vertebral canal, forms a type of tunnel for the sensitive spinal cord, which carries signals from the brain to the body. Spinal nerves also run from the canal to the arms and legs.

SPINAL CANAL STENOSIS

Narrowing of The Spinal Canal

Stenosis means narrowing and describes constriction of the spinal canal. Doctors essentially distinguish between lumbar and cervical spinal canal stenosis. Lumbar stenosis occurs in the lumbar spine and initially causes back pain, a reduced range of movement or muscle tension within the area. If the canal becomes narrowed as the condition progresses and puts pressure on the spinal cord, nerves or blood vessels, as a consequence, it can cause symptoms of weakness, altered sensation and bladder problems or numbness in the legs and feet. With cervical stenosis, narrowing occurs in the area of the cervical spine. Sufferers experience neck pain radiating to the arms, an unstable gait or tense arm muscles. Untreated, persistent compression on the spinal cord can damage it (myelopathy).

The most common cause of both forms of the condition is the ageing process. Over time, discs lose fluid, become thinner or tear, preventing them from cushioning movements as effectively. The elasticity of the surrounding ligaments also decreases, pushing the spinal canal together and destabilising the entire spine. Alongside signs of wear and tear, however, other culprits can include arthrosis of the spinal joints, a disc prolapse and injuries to the vertebral bodies or spinal surgery with excessive scar formation. Conservative treatments such as physiotherapy or pain therapy are recommended. Where the condition is advanced, we can release trapped nerves by widening the spinal canal using a micro-surgical procedure.

MYELOPATHY

Damage to The Spinal Cord

Doctors use the term myelopathy when the nerve tissue in the spinal cord, which runs through the cervical or thoracic spine is damaged. The spinal cord runs through the spinal canal, also known as the vertebral canal, along with nerve fibres and connects the brain and the peripheral nervous system. Between the vertebral bodies, nerves exit the canal and travel onwards to the arms, trunk and legs.

With myelopathy, there are anatomical and functional disorders as well as damage to the central nervous cells and nerve pathways of the spinal cord in the cervical or thoracic spine. The condition usually develops gradually over the course of several years, with an increasing pressure that narrows the spinal canal, trapping or irritating the spinal cord and nerves. The causes include wear and tear with associated bony deposits, slipped discs or tumours, for example. In this case, the condition is referred to as compression myelopathy. If vascular malformations or vascular stenosis are the cause, then doctors refer to this as vascular myelopathy. There is also a condition known as radiation myelopathy, which can be developed as a result of radiotherapy. Myelopathy can also occur as a consequence of an injury.

> “Therefore in medicine we ought to know the causes of sickness and health.”
>
> Avicenna, The Canon of Medicine, 1025.

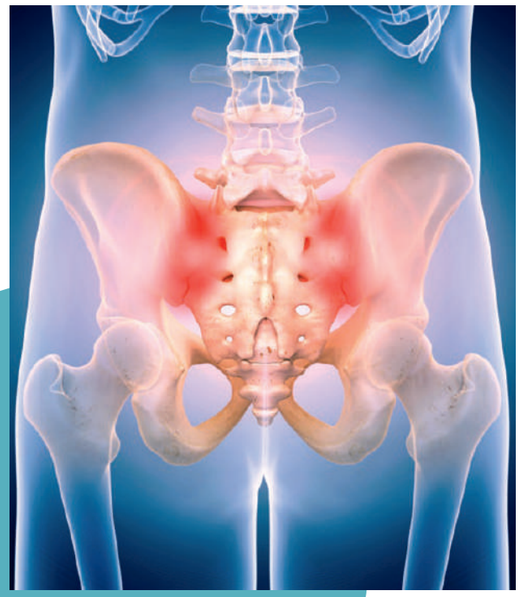
In this instance, sufferers experience increasing loss of their motor skills. Initially, symptoms such as pain or numbness occur in the arms or legs. Characteristic features include the falling asleep of arms or hands during sleep. Over time, complications such as gait disturbances, tissue loss, paralysis or even quadriplegia can occur. Long-term, myelopathy makes nerve tissue die. Since the central nerve cells in these areas are unable to regenerate or reproduce themselves, the damage is permanent. The insidious development of the process also means that there are no particular early warning signs. This is why, if such symptoms occur, the examination of a specialist or an MRI scan are recommended. To treat the causes of the condition, we surgically remove protruding tissue and calcifications and widen the narrowed areas.

PROBLEMS WITH THE LOWER BACK

Problems with The Sacroiliac Joints and Coccyx

SIJ Problems

The sacroiliac joint or SIJ is placed between the sacral and iliac bone. Unlike other joints, it has very little space to move since muscles and tendons hold it firmly in place in fact it cannot move by more than five degrees. This makes it the least mobile joint in the human body. As the interface between the pelvic girdle and the lower spine, the SIJ plays a major role in distributing forces between the upper and lower body, putting enormous strain on the joint. Pain in the area of the lower back occurs more commonly than expected from the sacroiliac joint since external influences or poor posture can lead to the SIJ shifting. Triggers for the symptoms include wear and tear, the adoption of relieving postures due to other pain or following operations, accidents, excessive strain or, in women, loosening of the ligaments after giving birth. Conditions also often manifest themselves through pain in the groin. In some cases, this pain can radiate to the buttocks or the thigh. The SIJ is one of the parts of the body that requires the most intensive treatment. Depending on the exact diagnosis, we can offer a wide range of conservative and surgical therapy options to treat SIJ-related back pain. One of them is the thermal denervation.



Coccygodynia

The coccyx is made up of 4-5 small vertebrae which have fused to form a single bone and is located at the lower end of the spine. The muscles, tendons and ligaments of the pelvis, the pelvic floor and the hip are attached to it. In terms of body statics, it has an important role to play. Pain in this area often occurs following a fall or, in women, following a difficult birth. Causes include nerve irritation, periostitis, tumours or congenital abnormalities. Doctors refer to chronic coccygeal pain as coccygodynia. Patients with this condition experience severe symptoms, especially when sitting. Conditions affecting the coccyx are often painful and prolonged since everyday stresses and strains can slow down the healing process. As well as using conservative methods to alleviate pain, we also offer denervation, which is a highly effective treatment.

TUMOURS AND METASTASES

The Spine Can also Be Affected

Tumours can develop anywhere in the body, including in the spine. A tumour does not automatically mean cancer because we usually refer to all kinds of growths or proliferation as a tumour. It is only following further investigations that the condition can be defined as benign or malignant and classed as primary or secondary. If the tumour is secondary, this is known as a spinal metastasis. Individual diagnosis and tailored therapies then take top priority. In the spine, tumour can occur outside, between and within the cord membranes (Dura) and spinal cord. Benign tumours usually grow slowly. This means that there is a good chance of healing through surgery if they are diagnosed early. If a tumour is pressing on nerves, these symptoms can occur: radiating back pain, feelings of weakness, numbness and disturbed bladder function. Isolated tumours can also attack the vertebral bodies. This can lead to vertebral fractures and instability of the spine. Procedures for malignant tumours and metastases are accompanied by chemo or radiotherapy. Benign tumours, on the other hand, can usually be removed surgically. In some cases, stabilisation measures with vertebral fixation are required.

OTHER CONDITIONS AFFECTING THE SPINE

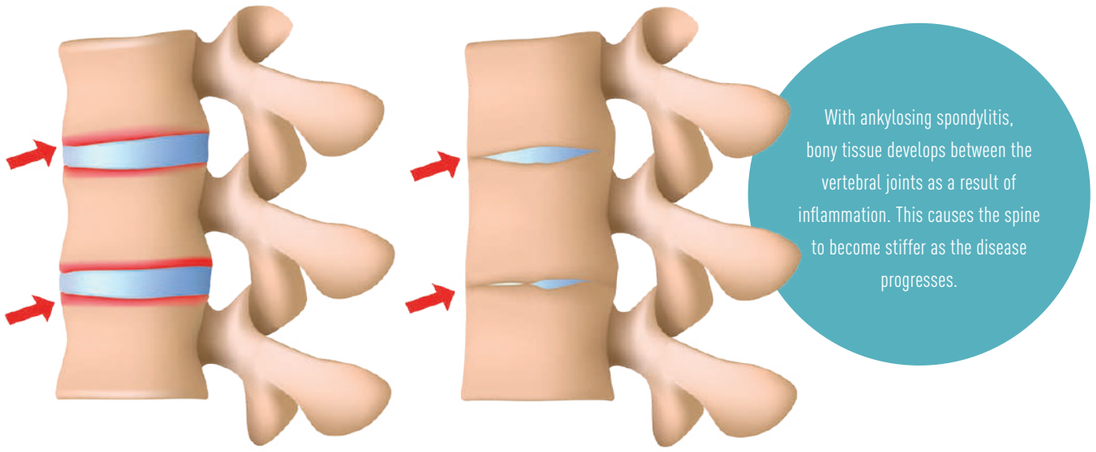
Syringomyelia and Ankylosing Spondylitis

Syringomyelia

Under Syringomyelia we understand the formation of a fluid-filled cavity in the spinal cord. Different symptoms occur, depending on the localisation. These range from pain in the extremities to altered sensation and even paralysis. There are many causes for this condition. They include inflammation of the spinal cord as well as traumatic injuries to the spinal cord, vascular malformations and in rare cases also tumours. Even though the condition has so far not been curable, we are able to alleviate symptoms and slow down its progress. A micro-surgical procedure allows us to drain the fluid. This reduces the pressure on the spinal cord.

Ankylosing Spondylitis (morbus Bechterew)

Ankylosing spondylitis is a rare form of the chronic inflammatory rheumatoid disease which causes changes to the spinal joints. In addition, ossification of the areas around the joints also occurs in various areas of the spine, resulting in parts or the entire spine gradually becoming stiffer and deformed over time. Inflammation can also occur of the tendons, eyes and the heart muscle. The causes of the disease are not yet fully understood, however, researchers currently believe that behind it there is a malfunction of the immune system. Characteristic symptoms such as morning stiffness in the back and neck, chronic back pain, restricted movement and curvature of the spine only occur in the more advanced stages of the condition, making diagnosis more difficult. If conservative treatment options are no longer sufficient to alleviate the pain, then thermal denervation has been proven to be especially effective.



With ankylosing spondylitis, bony tissue develops between the vertebral joints as a result of inflammation. This causes the spine to become stiffer as the disease progresses.

Depending on the condition and its symptoms, we may consider pain therapy. This is an approach designed to alleviate acute and chronic pain. Treatment of the pain itself represents a key pillar of our holistic therapy concept. However, it is usually not used as an isolated treatment, but rather in combination with other methods.

PAIN THERAPY

Effectively Alleviating Symptoms

Injections and Infusions

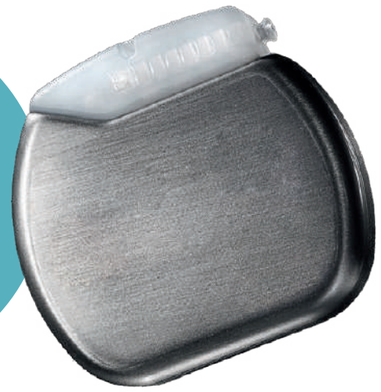
As well as taking painkillers, injections or infusions offer an alternative form of pain treatment, including facet injections or peri-radicular therapy (PRT). With this therapy, we inject pain and inflammation-relieving medications directly into the affected nerve branches or roots. Medications, therefore, work exclusively on the source of the pain without affecting the rest of the body. The injections are carried out under computer tomography (CT), magnetic resonance tomography (MRI), or under X-Rays control, in order to ensure precise positioning of the injection. This type of treatment is used for acute pain in order to provide temporary pain relief. However it is also used for diagnostic purposes: if an injection produces a significant improvement in symptoms, the cause of the symptoms has been found.

Treatment Details
Duration of Treatment: approx. 10–15 minutes as an outpatient
Inpatient Stay: In the context of conservative pain therapy 10 days

Spinal Cord Stimulation

Spinal cord stimulation can alleviate chronic pain conditions caused by post-nucleotomy syndrome, diabetic polyneuropathy syndrome or phantom pain. An implanted pain pacemaker sends a weak electrical impulse with exact parameters to the spinal cord. These changes the pain signal before it reaches the brain. Instead of severe pain, patients experience just a pleasant tingling. This may not treat the cause, but it does address the symptoms, reducing pain, decreasing the amount of medication consumed and significantly improving the individual's quality of life. In order to observe the extent to which the neurostimulator relieves the pain, we will implant an electrode directly into the spine for an approximately 7-day test phase. This minimally invasive procedure is carried out under local anaesthetic in order to determine the correct position. If the test phase is successful, patients will have the pain pacemaker implanted under their skin. They are also given a programming device which allows them to adjust the intensity of the stimulation according to their degree of pain or for various times of the day and activities.

Treatment Details
Duration Of The Test Phase: approx. 1–2 hours
Inpatient Stay: 7–10 days
Duration Of The Implant Procedure: approx. 30 minutes
Inpatient Stay: 7 days



Denervation

Thermal denervation is a low-risk and minimally invasive method used to treat back pain caused by facet syndrome or symptoms of wear and tear. It can also be used for sacroiliac joint pain and coccygodynia. The targeted deactivation of irritated nerves helps to stop the transmission of pain. Under a general anaesthetic and X-ray guidance, the nerve ends, which transmit the pain signals, will be destroyed with heat. Using a fine probe, heat is deployed to interrupt the nerve's ability to transfer pain signals. Immediately after the procedure, patients feel a significant improvement in their symptoms. The advantages lie in the targeted effect and long duration of action, from several months to a few years. In a survey, 80% of our patients stated that they had no or only slight pain following a denervation procedure. As a result of the reduction in pain, patients no longer need to take painkillers after the treatment and in many cases; patients are able to re-engage with physiotherapy or movement training. Strengthening of the muscles reduces the strain on the vertebrae. This frequently means that there is no need for further procedures.

Treatment Details
Duration of Treatment: 60 minutes
Inpatient Stay: 7 days

If conservative methods are not sufficiently effective in treating intervertebral disc symptoms, we can offer you the latest minimally invasive treatment methods that can provide gentle and rapid relief.

INNOVATIVE METHODS FOR DISC SYMPTOMS

A Gentle Approach to Symptoms

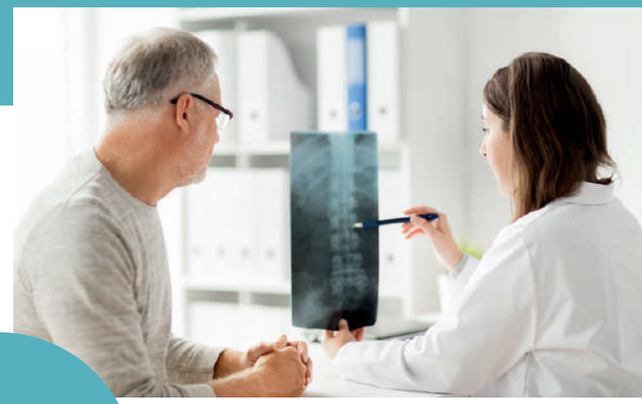
Percutaneous Nucleotomy

Percutaneous nucleotomy is ideal for treating disc protrusions and mild to moderate slipped discs. This minimally invasive procedure eliminates the cause of pain without unnecessarily damaging the surrounding tissue. Under local anaesthetic, a very thin, rotating spiral needle is introduced into the affected area via a small incision. This needle is then used to gently remove the disc protrusion. This reduces the pressure on the surrounding nerves so that patients experience relief immediately after the procedure.

Treatment Details
Duration Of Treatment:
approx. 30 minutes
Inpatient Stay: approx. 1 week

Fibrous Ring Occlusion

Following procedures on the intervertebral disc, conventional methods can entail the risk of recurrence, i.e. a new disc hernia at the same place. Especially if the tear in the fibrous ring remains open, it creates a "gateway" through which tissue can once again escape. To avoid this, we use a new suturing technique. During the procedure to remove the herniated disc material, we suture the fibrous ring back together using a special thread that is extremely strong and elastic. The thread does not dissolve and therefore remains permanently in place. This new method allows the likelihood of a further episode to be significantly reduced.



Percutaneous Laser Disc Decompression

For mild cases of a slipped disc, in particular, the minimally invasive method of percutaneous laser disc decompression, or PLDD, is able to achieve great success. Unlike an operation, this procedure does not require any open incision, which means that neither muscles, joints nor nerves are injured. Instead, the procedure is carried out percutaneously, i.e. through a punctures of the skin. Using a CT scanner or image intensifier, we guide a special needle into the disc protrusion. The thin optical laser fibre is advanced into the middle of the protruding tissue. Laser energy shrinks the protruding part of the disc. The evaporation of the inner parts of the protruded tissue creates an immediate reduction in volume and pressure. This relieves the pressure on neural structures and, as a result, provides pain relief. A crucial advantage of this procedure is that it can be carried out on several segments of the spine.

Treatment Details
Duration Of Treatment:
approx. 30 minutes
Inpatient Stay: approx. 1 week

Anti-Scarring Gel

Alongside a recurrence, there is another reason why patients develop pain again sometime later following successful intervertebral disc surgery: scar tissue. These are fibrous tissues that surround the roots of the nerves. They are able to restrict the nerves' mobility and impair the blood supply to the nerve root, as well as the circulation of cerebrospinal fluid. In order to prevent these problematic growths from developing in the first place, we use anti-scarring gel. Injected directly around the nerve during the procedure itself, it surrounds the nerve and prevents the formation of scar tissue. After around 12 weeks, the gel dissolves of its own accord.

RESTORING FUNCTION

Intervertebral Disc Replacement Relieves Pain and Maintains Mobility

Artificial Intervertebral Disc

Patients with severe back pain sometimes have severe damage to the intervertebral discs, known as degeneration. If conservative methods are unsuccessful, the damaged disc can be replaced with an artificial one. Made from two titanium plates connected with a flexible, mobile piece of plastic, the disc prosthesis acts as a place holder and simultaneously allows the segment to move. The tremendous advantage of this method compared to fusion surgery is that the section of the spine remains mobile. At the beginning, we remove the affected intervertebral disc under general anaesthetic. If there is a slipped disc or narrowing of the spinal canal, we treat this directly at the same time. We insert the prosthesis into the created space. Over time, due to the roughened surface of the titanium plates, it integrates into the surrounding tissue and in so doing performs the cushioning function of a natural intervertebral disc. Disc prostheses are often used for slipped discs in the area of the cervical and lumbar spine.

Treatment Details
Duration of treatment:
approx. 90 minutes
Inpatient stay: 7–12 days

Disc Cell Cultivation

To treat mild to moderate disc degeneration, we offer an innovative, minimally invasive method known as disc cell transplantation. The treatment is carried out in three steps. In the first step, the disc cells are collected: in patients with mild to moderate disc protrusions, we win the disc material via a biopsy (percutaneous nucleotomy) under local anaesthesia. If there is a severe slipped disc, the material is taken by the micro-surgical removal of the slipped part. The second stage involves the cultivation of the tissue: in a special laboratory experts isolate the healthy cells under strictest safety standards and cultivate them in an incubator. The cells are implanted in step three: after just 4 weeks, we introduce the newly cultivated cells into the jelly-like core under local anaesthetic. This increases the disc's elasticity and allows it to resume its natural function as a shock absorber. Thanks to the use of the body's own cells, there is no risk of any allergic rejection response.

Treatment Details
Duration of Treatment:
less than 30 minutes
Inpatient Stay: 3–4 days

TREATING THE CAUSES

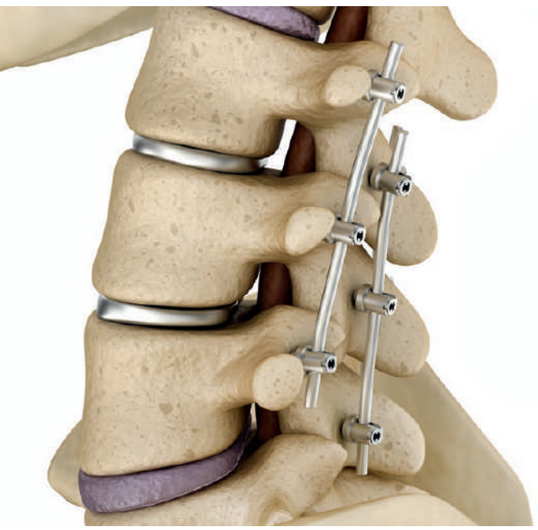
Microsurgery on The Spine

For conditions such as slipped discs, spinal canal stenoses, tumours and syringomyelia, micro-surgical procedures are commonly used since they allow not only treatment of the symptoms, but also the causes. Unlike conventional surgical methods, a small incision of few centimetres is sufficient. With micro-surgery, the operation is carried out using a special surgical microscope and micro-instruments. This puts significantly less strain on the body, reduces the risk of scar tissue and allows patients to recover more quickly.

Vertebral Body Replacement

If a vertebral body is affected markedly or damaged as a result of tumours, metastases or vertebral fractures and is therefore no longer able to weight-bear, then instability of the spine is common. In this case, we remove the affected vertebral body and replace it completely with an artificial one. The implantation of the artificial vertebral body is supported by additional stabilisation, in order to ensure more stability.

Treatment Details
Duration of Treatment: 2–3 hours
Inpatient Stay: 12–18 days



Stabilisation (Spondylodesis)

Stabilisation, also known as fixation or fusion, is used in cases with instability of spine in the cervical, thoracic or lumbar regions. This type of instability can occur as a result of injuries, fractures and tumours, but also because of degeneration, wear and tear, vertebral slipping and following aggressive operations on the spine. Stabilisation is carried out either as a standalone treatment or in combination with other procedures such as disc replacement, the placement of a cage or spinal canal widening. In this procedure, which is carried out under general anaesthesia, we fix the affected vertebra using titanium elements. After a few months, in which the treated segments become more solid and more stable, most patients are able to move normally again and even perform jobs that require a lot of movement.

Treatment Details
Duration of Treatment:
approx. 3 hours
Inpatient Stay: 12 days

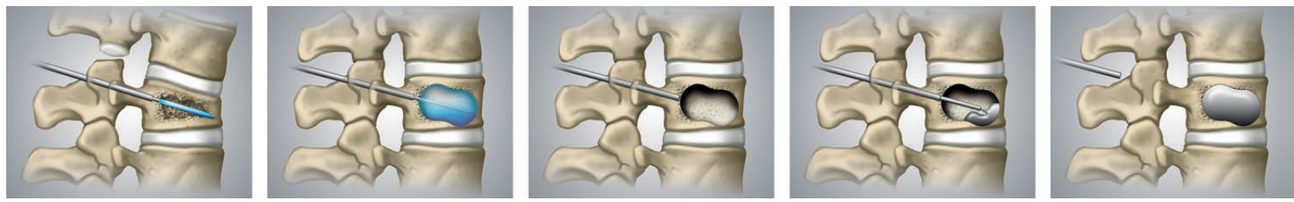
TREATING VERTEBRAL FRACTURES

Kyphoplasty – Stabilising with Bone Cement

Kyphoplasty is effective for bone fractures.

Vertebral body fractures occur commonly in osteoporosis due to diminishing bone density. While conservative treatments help to relieve pain from stable fractures, unstable fractures require intervention in many cases. Minimally invasive kyphoplasty is ideal for re-straightening and stabilising the spine. With this procedure, the vertebral body is realigned using a balloon and then filled with special bone cement. The advantage of this innovative treatment lies in the fact that the patient experiences rapid pain relief. The procedure also prevents any further collapse of the vertebral body.

Treatment Details
Duration of Treatment: 1 hour
Inpatient Stay: 7–10 days



TO STOP HEADACHE

Nerve Blockade and Denervation

There are many different types of headache. The causes of headache include changes in the cervical spine. In this case, the symptoms begin in the neck and then spread towards the forehead. Other symptoms include nausea, dizziness and sensitivity to light and sounds. Visual disturbances can also occur, but these are rare. In some cases, the condition involves neuralgia of the occipital nerves with the radiation of pain from the back of the head, and not uncommonly this reaches as far as the forehead. One alternative to taking powerful medication is a therapeutic nerve blockade. Using fluoroscopic guidance, anti-inflammatory and pain-relieving medications are injected into the posterior, i.e. dorsal spinal joints in the neck area or the occipital nerve in order to prevent the pain signals from being transmitted onwards.

Deactivation of The Nerves (Denervation)

If painkiller, acupuncture and physiotherapy fail to alleviate the symptoms, denervation can ensure longer-lasting deactivation of the nerves. Under X-ray guidance and general anaesthesia, we insert a special cannula in the path of the irritated nerve fibres. To check the exact condition, the nerves are stimulated using a tiny electrical current. Once the correct position has been determined, heat is generated. This destroys the nerve tissue, stopping it from being able to transmit pain signals. Patients subsequently get red from the pain and get back their quality of life.

We're here for you whenever you need us. Do you have any questions, or would you like to arrange an appointment? Then please get in touch. Following an in-depth consultation, we will be happy to discuss with you treatment options in detail. If you would like a second opinion on your treatment, we are also happy to help.

OUR SERVICES:

Avicenna Clinic

- Team with many years of international experience
- Diagnosis, treatment, follow-up and prevention all under one roof
- Holistic treatment concepts that put the patient first – all coordinated with your needs
- 24-hour service – both outpatient and in-patient
- Interdisciplinary collaboration between various specialities such as Spine surgery, neurosurgery, orthopaedics, joint surgery, Physiotherapy, radiology, pain therapy and anaesthetics
- Multi-lingual staff
- Comfortable patient rooms in a pleasant setting
- Cosy café serving small snacks and drinks for your well-being
- Central location in the heart of Berlin

You can also find more information about us at
www.avicenna-klinik.de

Always here for you

Our team is always ready to answer your questions, arrange appointments and offer consultations at any time. You can find us here:

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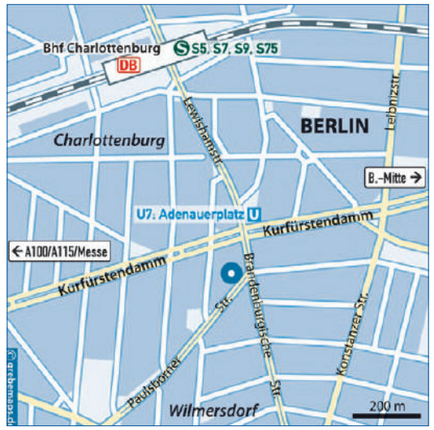

LEGAL INFORMATION

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“Your health is our success.”