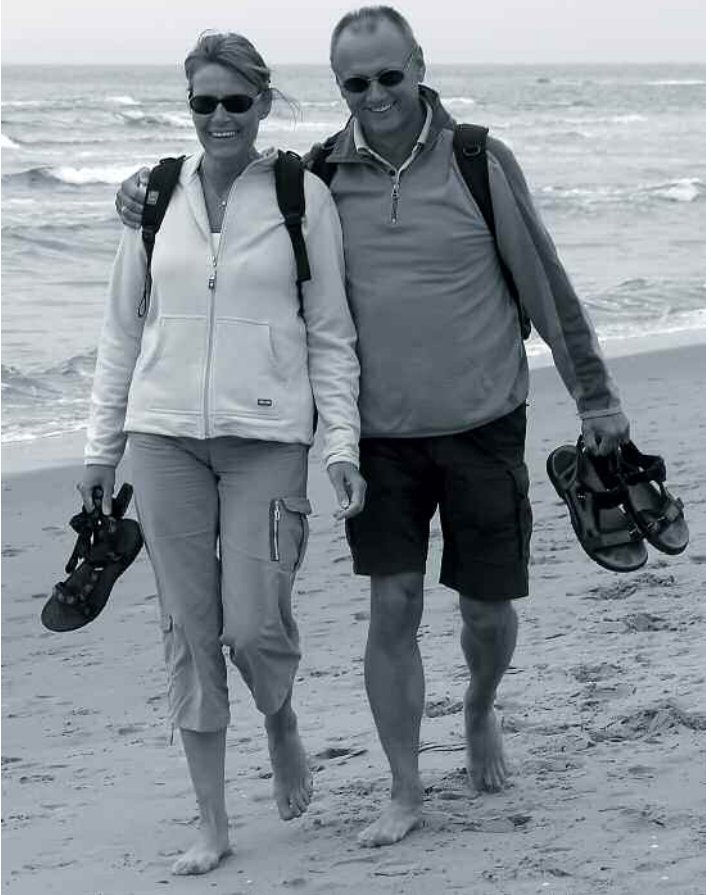


joimax[®]
helping to treat patients



PATIENT INFORMATION

**The best treatment
to regain your quality of life**

**Treatment of herniated discs
through the "keyhole"**



C O N T E N T S

Preamble	3
If your back “flares up”	4-5
The spine	6-8
The herniated disc	9-10
The correct treatment of herniated discs	11-12
The TESSYS® method	13-15
Back on your feet in no time	16
Targeted prevention	17
Advice and help for patients with herniated discs	18-19
Bibliography	20

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Important!

All information contained in this brochure is of general nature and does not replace a detailed informative discussion nor an individual medical consultation.



Dear Patient,

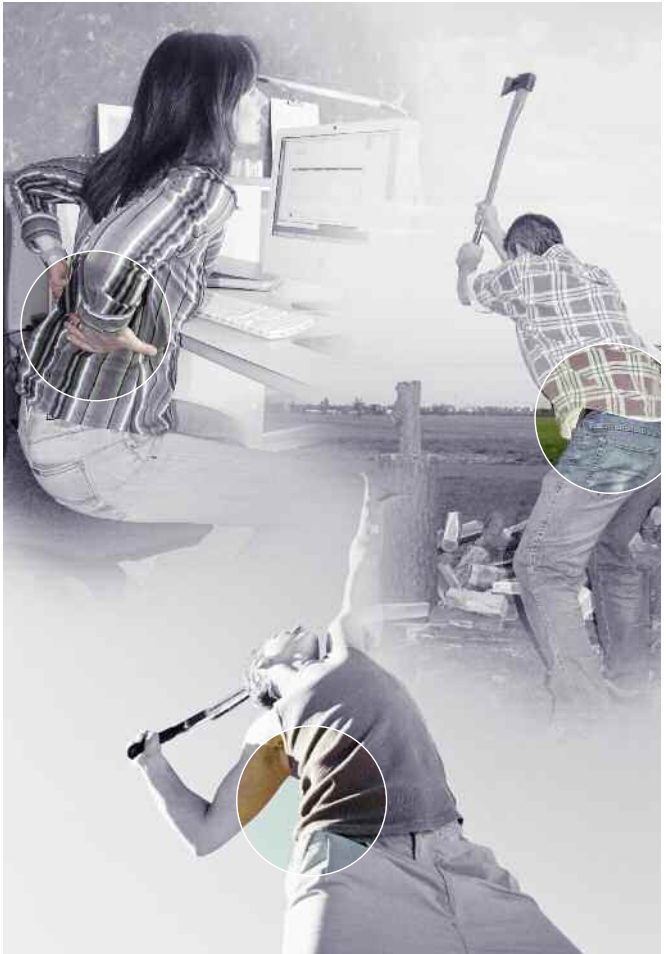
a herniated disc can affect anybody at any age. Even children and people in peak physical condition can suffer from it. One single awkward movement can be enough to “put out” an already damaged spine.

The risk of suffering from a herniated (prolapsed) disc can be increased by unilateral strain during work or leisure, being overweight, bad posture, genetic inheritance and a lack of muscular strength.

The following pages contain information on how you can get on top of your back problems as quickly as possible, in addition to suggestions regarding a “spine friendly” way of life, and valuable information for gentle and effective therapy.

Your **joimax®-Team** would like to wish you a speedy recovery!

Turn your back on backache: when your back "flares up"



Backache is a common ailment: more than 60 percent of Germans complain of backache, and 10 percent of these suffer from complaints so severe that they impede their everyday life and work. On a statistical average, every German citizen is therefore absent from work for two to three and a half days per year. However, current research by the Greifswald University has revealed that only every second person suffering from backache consults a doctor.

The stronger sex is the first to buckle

A herniated disc is often the cause of the pain. Experts estimate that 5 percent of all men and 2.5 percent of all women suffer from a herniated disc in the lumbar region (by far the most frequent variety) in association with so-called radicular pain, as well as leg paralysis and/or numbness at least once in their lives. This is caused by pain emanating from the nerve roots and radiating into the surrounding regions of the body.

Taking backache seriously

Pain caused by a herniated disc is enormously stressful and severely limits the quality of life. Chronic pain can also drive the affected person into isolation, with the sufferer often not daring to leave the house and frequently taking up a “preventative” position. A family excursion or even a get together with friends or acquaintances can often be an excruciating ordeal. This prompted approx. 80,000 (legally insured) patients with herniated discs to undergo surgery in 2005 (excluding the unknown number of privately insured patients). This places them in prominent company.

Athlete Grit Breuer (2002 European Vice-Champion over 400 meters) and Austrian songwriter Reinhard Fendrich have both had spinal surgery, and even American actor George Clooney has complained about back problems during interviews.

Early relief from pain

Those suffering from chronic pain - and this includes backache - should seek medical help as quickly as possible, otherwise there is the danger that the nervous system may “retain” the pain, so to speak. Chronic pain over-sensitizes the nerve cells to such an extent that they may later signal “pain”, for instance with light contact, although there may be no comprehensible reason. Scientists call this phenomenon “pain memory”.

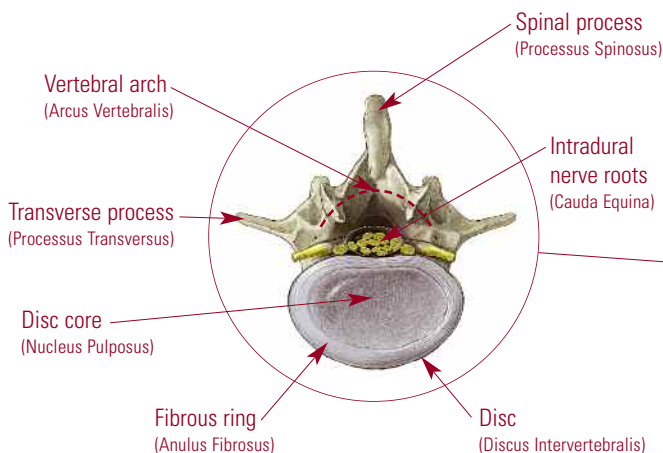
Mobile body axis: The spine

Sitting, lying, hopping, running, bending over or turning your head – none of these would be possible without your spine. Our body's central axis enables movement and activities in various directions (bending forwards, stretching backwards, leaning sideways and rotating movements) whilst also ensuring stability.

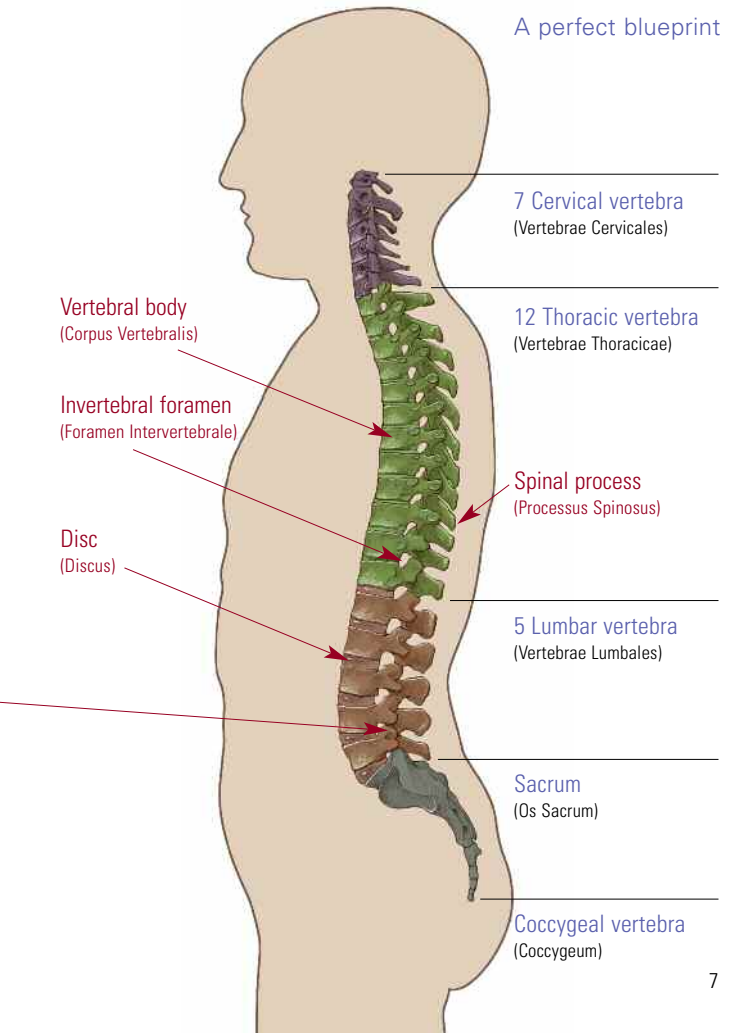
Nature's ingeniously devised blueprint consisting of bones, ligaments, tendons, discs, muscles and nerves ensures that the "multifunctional spine" is able to carry out these tasks perfectly.

S-curves for flexibility and stability

When viewed from the side, the spine and its curves resemble a double S. These curves - called lordosis or kyphosis, depending on the position – ensure that the body is able to absorb impacts and leaps and is optimally supported. When viewed from behind, a healthy spine looks like a straight rod.



With a total of 24 vertebrae, the spine is divided into three sections: the cervical spine (7 cervical vertebrae), the thoracic spine (12 thoracic vertebrae) and the lumbar spine (5 lumbar vertebrae). The sacrum and coccyx (or tailbone), consisting of ten vertebrae in total and fusing to form a bone block between the ages of 20 and 25 years, are connected to the lumbar spine.

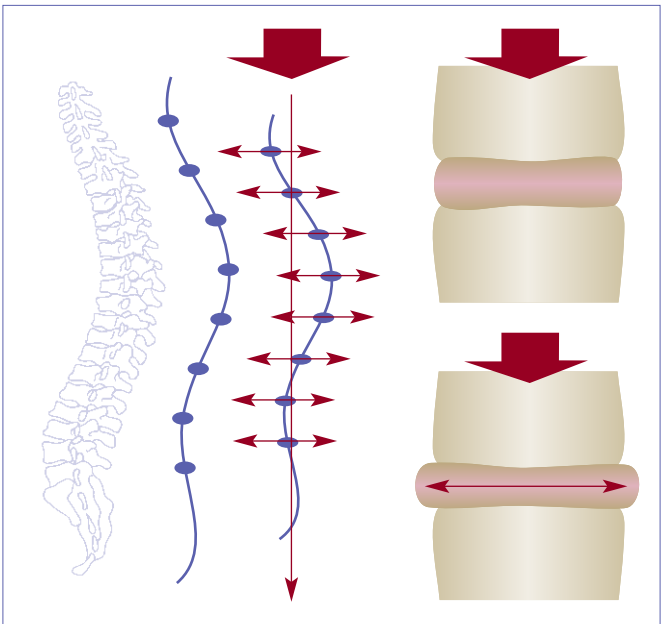


The back's shock-absorbing technology

A vertebra consists of a solid frontal vertebral body and the narrower vertebral arch with vertebral joints and vertebral processes behind. The vertebral body functions like a carrier, with the spinal marrow and intradural nerve fibers proceeding through the protected canal consisting of vertebral arches (vertebral canal and hard dura). The muscles are attached to the two transverse processes and the spinal process. (Also refer to images on page 6 and 7).

The discs act as buffers between the individual vertebrae. With their gel-like, soft, water-filled core – which is surrounded by a cartilaginous fibrous ring – they cushion any impact and allow better vertebra mobility.

An intervertebral foramen – from which the spinal nerves protrude to the left and right sides, thus leaving their protected area – is located between the vertebra and the disc.



The double-S and discs cushion any impact

The spine under pressure - the herniated disc



A herniated (prolapsed) disc occurs when parts of the disc slip into the vertebral canal, thus causing pain to a larger or lesser degree. The reason: the soft, gel-like disc core penetrates the circumjacent fiber jacket and presses on the surrounding nerve tissue. The back muscles tense simultaneously, causing additional pain.

Strong muscles protect

There are many causes: weak stomach and back muscles, predominantly seated activities, excess weight and unfavorable body postures during everyday life (for example, using wrong lifting techniques or continuous or long driving hours, especially for the cervical spine). Hereditary malposition of the spine and pregnancies also abet the clinical symptoms. Age is another matter, with loss of liquid from the discs increasing over the years. This porous structure can sometimes cause the disc core to leak and create a herniation.

A look into our body sheds light on the topic

Nowadays, diagnosis is generally performed with the help of MRI – magnetic resonance imaging. This gentle, non-radioactive imaging procedure uncovers protruding or herniated discs. A computer tomography (CT) also provides excellent results.



MRI - lateral view:
Lateral prolapse L4-L5

A herniated disc need not automatically cause pain. Problems especially arise when the protruding disc presses on the surrounding nerves. This often leads to severe backache, which radiates into the legs and at worst may cause a feeling of numbness, paralysis or even organic dysfunction (e.g. bladder and intestinal problems).

Such a severe herniated disc rarely comes out of the blue, even if one awkward movement may sometimes be the straw that breaks the camel's back (or yours, in this case). However, in most cases the back has already been previously affected – sometimes even without the knowledge of the person concerned.

The lumbar region's weak spot

The most herniated discs occur in the lumbar region, followed by the cervical and thoracic regions. Lateral herniated discs occur most frequently, which then irritate the right and/or left spinal nerve.

The Correct treatment of herniated discs



When experiencing back problems or herniated discs the first person to contact is a neurosurgeon or orthopedic specialist, who may then obtain a further opinion from a neurological specialist (neurologist), especially if the pain is no longer limited to the back alone.

The nature of the complaint determines the therapy

Treatment of a herniated disc depends on the symptoms. First priority is always the so-called conservative therapy, which consists of active (e.g. physiotherapy) and passive (e.g. heat treatment, massages) treatment methods – supported by pain relieving medication, if required. An attempt with acupuncture, relaxation therapy, spinal training or medical strengthening therapy is also worthwhile (www.kieser-training.com). However, should none of these Methods help, surgery may be considered.

Conservative relief: therapeutical precision work

Non-surgical therapy targets the precise and gentle development of muscles, release of tension and relief of pain. Physiotherapeutic exercises and medical strengthening therapies are particularly suitable for targeted muscle development. Massages loosen tense muscles.

Stretching treatments to relieve the strain on the disc are also helpful, and pain-relieving and anti-inflammatory medication also support therapy. Doctors sometimes administer these drugs not only in tablet form, but can alternatively infuse the active ingredients directly where needed (infiltration procedure).

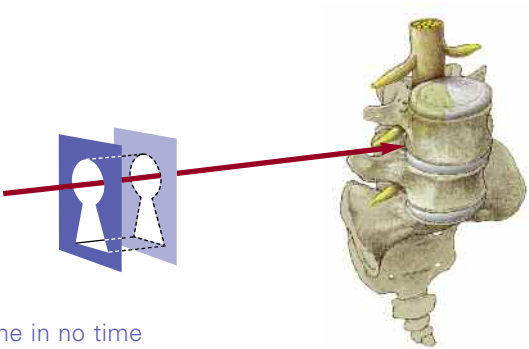
The operation: a good chance for severe cases

There is no doubt about it: nobody likes to go under the knife. However, for many patients with herniated discs, surgery is the only chance of permanently getting rid of their complaints and finding a way back to their original quality of life. Conservative procedures such as physiotherapy are often no longer sufficient, especially if the surrounding nerves are already affected and the pain has become unbearable or even crippling.

During the course of this operation, the surgeon removes the protruding disc tissue pressing on the nerves.

Keyhole operations: gentle and effective

Modern surgical techniques are increasingly replacing the classic open surgery. This includes so-called minimally invasive surgery on herniated discs, in which surgeons work through a type of “keyhole” with the help of technically sophisticated instruments and devices, without the need for a scalpel. This endoscopic technique enables extremely gentle herniated disc operations. The usual five to ten centimeter long incision is therefore obsolete, with the surgeon instead performing the operation through a small puncture with a hollow needle.



Back home in no time

This “bloodless” procedure (e.g. with the modern TESSYS® method) offers the patient a number of advantages:

- The tissue around the spine is not injured by the procedure. This prevents larger scars, the risk of infection is considerably reduced and the healing process is generally less complicated than with classical operational methods. Subsequent wound or muscle pain is very rare.
- The approximately 45 minute long operation is performed under local anesthetic, usually in combination with a sedative - the patient remains responsive throughout. General anesthesia and its associated risks becomes obsolete.
- Due to this gentle partial anesthesia, patients can often get up after just a few hours and even leave the clinic on the same day. A very pleasant situation for the patient, who also saves costs due to shortened hospital stays.

The TESSYS® system: Keyhole technology of the highest standard

Endoscopic disc surgery not only requires the surgeon's dexterity, but also background methods and technology which create optimum surgical conditions. One milestone in this regard is the TESSYS® method, which has a multifunctional operational system to achieve excellent results – even in difficult cases.

For the gentle removal of a herniated disc, this operational system uses a lateral endoscopic access point via the intravertebral foramen - in other words, it uses a natural entry point. During the operation, the patient is either in the lateral or prone position (Fig. 2 and 3)



Fig. 2: Lateral position

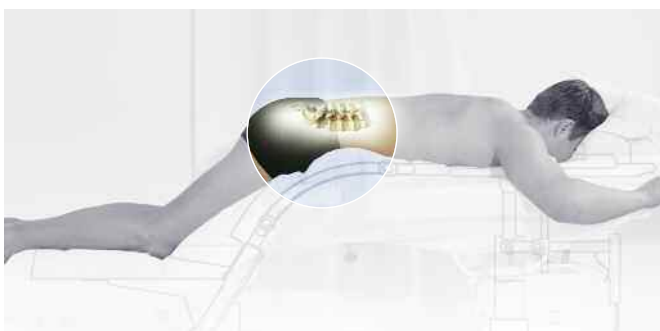
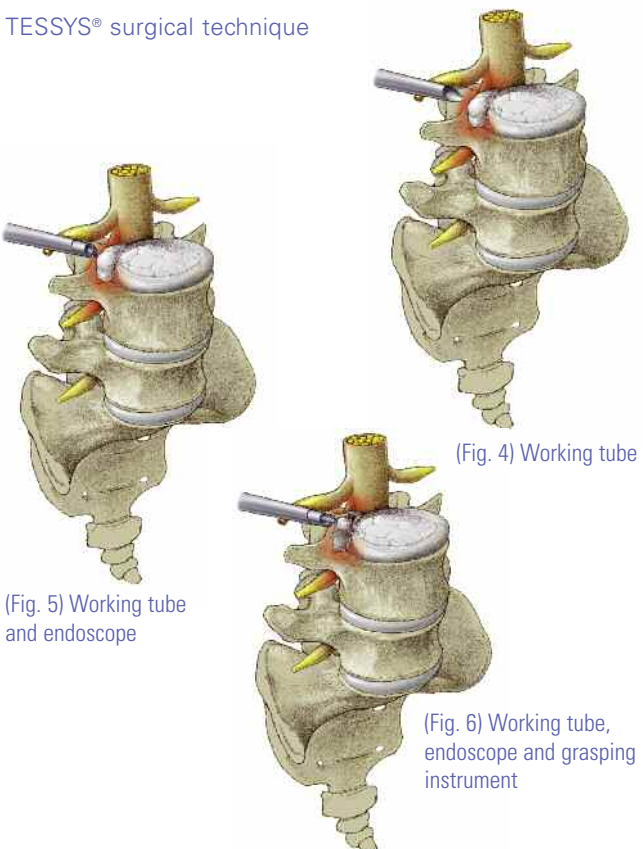


Fig. 3: Prone position

Minimum strain (minimal surgery) – maximum success

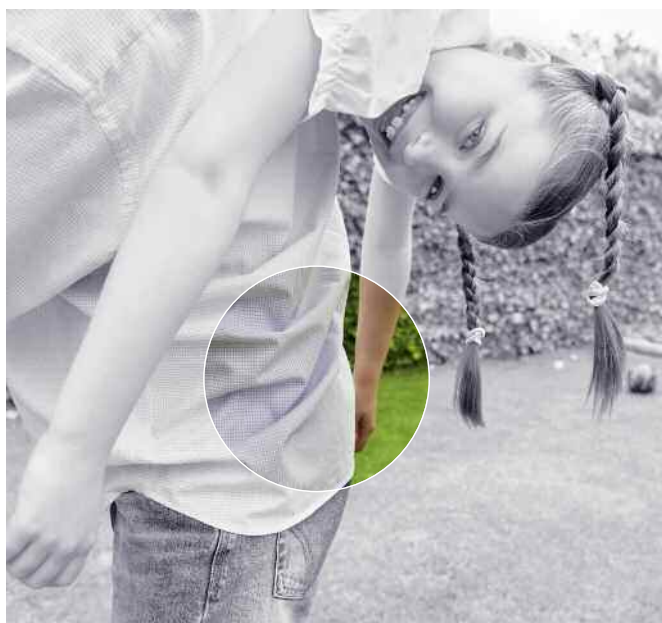
The surgeon slides the endoscope (Fig. 5) through a working tube (Fig. 4) and into the surgical area under x-ray. Various fine instruments can be inserted through the working channel of the endoscope (Fig. 6). To prevent this from injuring any nerves, the surgeon gently expands the intervertebral foramen millimeter by millimeter with the use of special reamer instruments – thus enlarging the already existing “door” to the vertebral canal. The endoscope is connected to a camera, which delivers high-definition images of the surgical procedure to a monitor. The applied instruments, such as forceps and grippers, can thus be used under constant observation. The perfectly controlled removal of the protruding disc tissue is therefore ensured.

TESSYS® surgical technique



Back on your feet in no time: thanks to state-of-the-art technology

Studies have proven that those who select a minimally invasive, modern operational procedure are back on their feet in less time. The renowned US research clinic "The Cleveland Foundation" agrees that the recovery period in patients operated on with the TESSYS® method is accelerated by several weeks to months in comparison to conventionally operated patients with herniated discs.



Progress in favor of the patient

Further research data substantiate this success: initial studies by users of the minimally invasive TESSYS® operational method confirm a success rate of over 93 percent.^{1,2,3}

The TESSYS® all-in-one system was developed in Germany over the last 5 years. In April 2008, 30 centers in Germany were already working with TESSYS®, with more than 75 centers worldwide.

Retaining your composure: targeted prevention of herniated discs



Everyday life is full of “back traps” which can be avoided with the right behavior and appropriate training. Take the strain off your back – “spine-friendly” lying, sitting, standing, carrying and lifting is so easy! Special back training sessions not only teach these techniques but also relaxation methods, and loosening, strengthening and stretching exercises to enhance the muscles surrounding the spine. Ask your medical aid, local sports club or gyms specialized in back muscle training for an appropriate offer. This is especially crucial following a disc operation!

Prevention is better than cure

Get moving! The best sports are cycling, swimming, aerobics, walking, hiking and dancing. Please be careful with sports like badminton, weight lifting, golf, hockey, rowing, alpine skiing and squash – these sports can strain your back.

Advice and help for patients with herniated discs

The TESSYS® System is already used successfully in numerous hospitals and out-patient surgical centers.

Whether you would like more information or are looking for advice and understanding, there are numerous organizations and self-help groups which give security to patients with backache, and accompany them on the road back to the most “normal” life possible.

The following links may provide helpful information:

NASS

www.spine.org

SpineUniverse

www.spineuniverse.com

Spine health

www.spine-health.com

BASS

www.spinesurgeons.ac.uk

IITS

www.iits.org

ISMISS

www.ismiss.com

SAS

www.spinearthroplasty.org

SMISS

www.smiss.org

Obtain further information on the operation procedure and the centers carrying out the procedure by contacting joimax on: Phone +49 (0) 721 255 14-0 or E-mail info@joimax.com.



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