

AN INTRODUCTION TO

XLIF[®]

eXtreme Lateral Interbody Fusion

This booklet is designed to inform you about the eXtreme Lateral Interbody Fusion (XLIF[®]) surgical procedure. It is not meant to replace any personal conversations that you might wish to have with your physician or other member of your healthcare team.

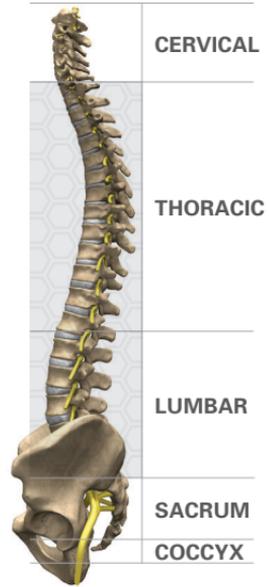
Not all the information here will apply to your individual treatment or its outcome. The information is intended to answer some of your questions and serve as a stimulus for you to ask appropriate questions about the procedure.



About the Thoracolumbar Spine

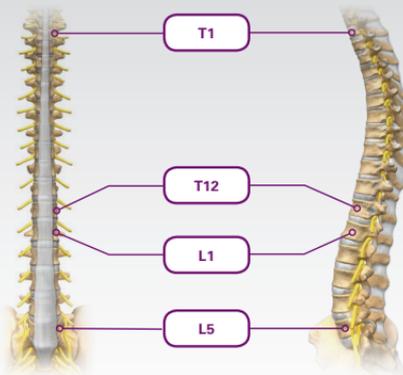
The **thoracolumbar spine** is made up of 17 bones, called vertebrae. Twelve vertebrae make up the thoracic (or chest) spine, and five vertebrae make up the lumbar (lower back) spine.

Between each vertebra are discs which provide the cushion necessary for spinal rotation and bending. These are called intervertebral discs. Each disc is comprised of two parts, a tough and fibrous outer layer (annulus fibrosis), and a soft, gelatinous center (nucleus pulposus). These two parts work in conjunction to allow the spine to bend, twist, and also provide shock absorption.



ZONE OF SPINE FOR THE XLIF SURGERY

Thoracolumbar Spine



Front and side views of the thoracolumbar spine

What is causing my pain?

There are several primary causes of spine problems. The majority of the symptoms are caused by either instability or by disc, bone, or ligaments pressing onto the nerve roots and/or spinal cord.

DEGENERATIVE DISC DISEASE (DDD)

During the natural aging process, the discs between each vertebral body can lose their flexibility, height, and elasticity which can cause a tear in the tough outer layer of the disc, causing the disc to herniate, bulge, or leak the gelatinous core. The bulges or leakages can end up compressing the nerve roots and/or spinal cord, causing symptoms including, but not limited to lower back and/or leg pain.

DEGENERATIVE SPONDYLOLISTHESIS

Degenerative spondylolisthesis is a condition where one vertebra has slipped forward over another one below it. This instability typically occurs as a result of degenerative changes but may also be caused by stress fractures, or congenital abnormalities (birth defects), and in rare cases from a tumor or trauma.

DEGENERATIVE SCOLIOSIS

Adult degenerative scoliosis is a condition where a right-left or lateral curve develops in a previously straight spine. This curvature occurs as a result of deterioration of the disc and joints in the back of the spine. As the joints degenerate they create a misalignment in the back, resulting in a bend or curvature, causing symptoms including lower back and/or leg pain.

What are my treatment options?

Many of the symptoms may be treated without surgery via methods that involve medication, rest, heat, and physical therapy. It is important that you speak to your physician about the best options for you.

If your symptoms do not improve with other methods, your physician may suggest spinal surgery. Surgery is reserved for those who do not gain relief from nonoperative forms of treatment, patients whose symptoms are increasing or worsening, and/or patients that present with a spinal condition which indicates the need for surgery.

What is an eXtreme Lateral Interbody Fusion (XLIF®) procedure?

The eXtreme Lateral Interbody Fusion (XLIF) technique is a minimally disruptive surgical procedure performed through the side of the body. It is designed to treat a range of spinal pathologies. Using patented nerve monitoring technology, the surgeon gains lateral (side) access to the spinal column, avoiding any major nerves in the area between the incision and the column. The XLIF procedure does not require an anterior (front) or posterior (back) exposure, and thereby does not present the same risks of vascular and/or neural injury as traditional approaches.

Is an XLIF right for me?

If you require spinal surgery, your physician may determine that the XLIF procedure is a good option for you. Some examples of pathologies (conditions) that may be ideal for the XLIF procedure include:

- Degenerated discs and/or facet joints that cause unnatural motion and pain
- Slippage of one vertebra over another (spondylolisthesis)
- Change in the normal curvature of the spine (degenerative scoliosis)

Conversely, your physician may determine that an XLIF procedure is not a good option for you. It is important to discuss this with your physician in order to determine the best course of treatment for you.

What are the potential benefits of having an XLIF[®] procedure?

- Smaller incision
- Less blood loss during surgery
- Reduced operative time
- Reduced hospital stay
- Reduced postoperative recovery time
- Significantly increases stability of the spine for long-term healing (fusion)

Benefits	XLIF Surgery	Traditional Lumbar Interbody Fusion Surgery
Blood Loss	< 100 cc/level ^{1,2}	500-1,000 cc/level ^{3,4}
Hospital Stay	1-3 days ^{1,5}	3-6 days ^{3,5}
Walking	Same day ⁶	3 days ⁷

¹Oliveira L, Marchi L, Coutinho E, et al. The use of rh-BMP2 in standalone eXtreme Lateral Interbody Fusion (XLIF[®]): clinical and radiological results after 24 months follow-up. *WscJ* 2010;1(1):19-25. ²Dakwar E, Cardona RF, Smith DA, et al. Early outcomes and safety of the minimally invasive, lateral retroperitoneal transpoas approach for adult degenerative scoliosis. *Neurosurg Focus* 2010;28(3):E8. ³Dhall SS, Wang MY, Mummaneni PV. Clinical and radiographic comparison of mini-open transforaminal lumbar interbody fusion with open transforaminal lumbar interbody fusion in 42 patients with long-term follow-up. *J Neurosurg Spine* 2008;9:560-5. ⁴Whitecloud TS 3rd, Roesch WW, Ricciardi JE. Transforaminal interbody fusion versus anteriorposterior interbody fusion of the lumbar spine: a financial analysis. *J Spinal Disord* 2001 Apr;14(2):100-3. ⁵Lucio JC, VanConia RB, DeLuzio KJ, et al. Economics of less invasive spinal surgery: an analysis of hospital cost differences between open and minimally invasive instrumented spinal fusion procedures during the perioperative period. *Risk Manag Healthc Policy* 2012;5(5):65-74. ⁶Ozgur BM, Agarwal V, Nail E, et al. Two-year clinical and radiographic success of minimally invasive lateral transpoas approach for the treatment of degenerative lumbar conditions. *SAS J* 2010;4:41-6. ⁷Park Y, Ha JW. Comparison of one-level posterior lumbar interbody fusion performed with a minimally invasive approach or a traditional open approach. *Spine* 2007;32(5):537-43.

The above data represents typical outcomes of patients being treated for degenerative disc disease, spondylolisthesis, and scoliosis.

What can I expect...?

Before surgery

Your physician will review your condition and explain all of your treatment options, including medications, physical therapy, and other surgeries such as removal of a diseased disc, fusion, etc.

Once you have been admitted to the hospital, you will be taken to a pre-op room and prepared for surgery. This may include instructions about the surgery, cleansing of your surgical site, as well as instructions about the postoperative period.

BEFORE

DURING

AFTER

What happens *during* surgery?

After you are sedated, positioned on your side, and draped, an x-ray image is taken of your spine to identify the location of the operative disc space.

**STEP
1**

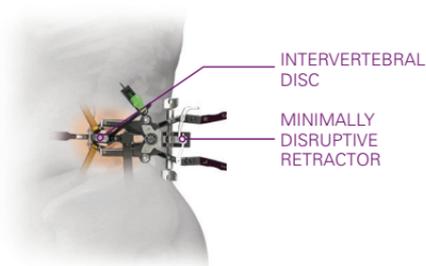
APPROACH

Your surgeon will make a small incision on the lateral (side) of your body. Dilators will be used to direct the path to the affected disc space while monitoring the local nerves. Once the safest path has been determined, a retractor will be utilized to hold the skin incision open, providing access and visibility to the affected area.

**STEP
2**

DISC REMOVAL

The diseased or damaged disc is removed to reduce pressure from the symptomatic cord or nerve root.



What implants are used?

Below are some examples of the implants that may be used during your XLIF® procedure:

**Interbody
Implant**



**Pedicle
Screws &
Rods**



BEFORE

DURING

AFTER

STEP 3
IMPLANT

An appropriate implant, chosen by your surgeon, will be placed into the disc space to restore the proper disc height and provide mechanical support while bone grows between the vertebral bodies during the fusion (bone healing) process. That segment of your spine will eventually stabilize once fusion occurs.

STEP 4
FIXATION

Generally, some method of internal fixation will be used to act as a stabilization device (internal brace) to help hold everything in place while fusion occurs. This could be a combination of screws and plates that are affixed to the adjacent vertebrae. Your surgeon will determine what, if any, kind of fixation is necessary during the procedure.

Postsurgical View



Postsurgical View with Lateral Plate



Learn more about XLIF®
Visit www.nuvasive.com

BEFORE

DURING

AFTER

What can I expect...?

After surgery

After surgery you will wake up in the recovery room, where your vital signs will be monitored and your immediate postoperative condition will be carefully observed. Most patients stay in the recovery room between one and three hours after surgery. Once the medical staff feels that you are doing well, you will be returned to your room in the hospital. It is normal for your incision to be sore immediately after surgery.

Most XLIF® patients are discharged from the hospital within 1-2 days after surgery, but your physician will determine the best postoperative course for you. The day after your surgery, your physician may instruct you to use a brace for a period of time to assist with the spinal fusion process. Supervised by trained medical professionals, your physician may ask you to carefully sit, stand, or walk within 24 hours of the surgery. Once you are discharged from the hospital it is important to limit your activities for a period of time (determined by your healthcare provider) to give your body a chance to heal. Your physician will discuss with you any pain medications to take home, as well as a prescribed program of activities. Your physician will provide instructions on wound care, exercises, and limitations to postoperative activity.

Are there risks involved?

Keep in mind that all surgery presents risks and complications that are important to discuss with your surgeon prior to your surgery. Listening to your physician's guidance, both before and after surgery, will help to ensure the best possible outcome from your procedure.

Potential risks following XLIF® surgery include: problems with anesthesia, infection, nerve damage, problems with the graft or hardware, and ongoing pain. This is not intended to be a complete list of the possible complications. Please contact your physician to discuss all potential risks.

Frequently asked questions

CAN I SHOWER AFTER SURGERY?

Depending on your surgical incision, you may have showering restrictions. Ask your physician for appropriate instructions.

WILL I HAVE A SCAR?

Your physician will discuss the incisions that will be made during an XLIF surgery. Very small scars of approximately one inch are common.

WHEN CAN I DRIVE?

For a period of time after your surgery, you may be cautioned about activities such as driving. Your physician will tell you when you may drive again.

CAN I TRAVEL?

The implants used in the XLIF procedure may activate a metal detector. Because of increased airport security measures, please call your local airport authority before traveling to get information that might help you pass through security more quickly and easily. Ask your physician to provide a patient identification card.

Notes

RESOURCES

For more information about the XLIF® procedure please visit:

www.nuvasive.com

If you would like to learn more about patient support and education for chronic back and leg pain sufferers and their loved ones, please visit:

www.thebetterwayback.org

If you have any questions about the XLIF procedure or spine surgery in general, please call or see your physician, who is the only one qualified to diagnose and treat your spinal condition. This patient information brochure is not a replacement for professional medical advice.

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