An introduction to

MAS® Midline

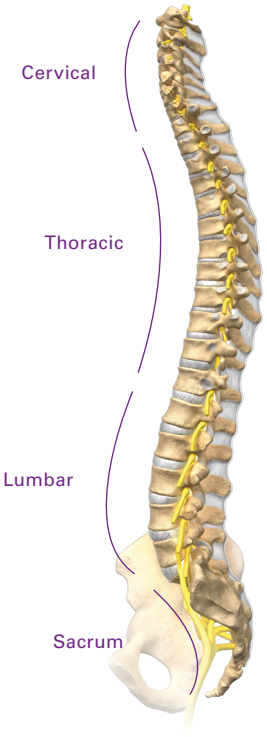
Maximum access surgery posterior lumbar interbody fusion

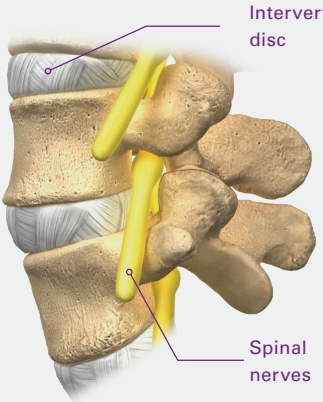
This booklet provides general information on MAS Midline. It is not meant to replace any personal conversations that you might wish to have with your physician or other member of your healthcare team. Not all the information here will apply to your individual treatment or its outcome.

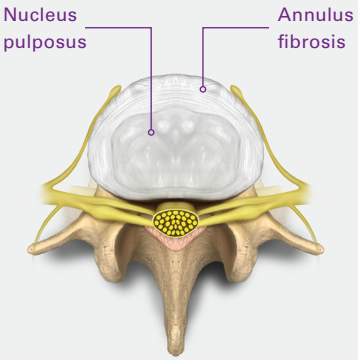
About the spine

The human spine is made up of 24 bones or vertebrae in the cervical (neck) spine, the thoracic (chest) spine, and the lumbar (lower back) spine, plus the sacral bones.

Vertebrae are connected by several joints, which allow you to bend, twist, and carry loads. The main joint between two vertebrae is called an intervertebral disc. The disc is made 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 move, and also provide shock absorption.





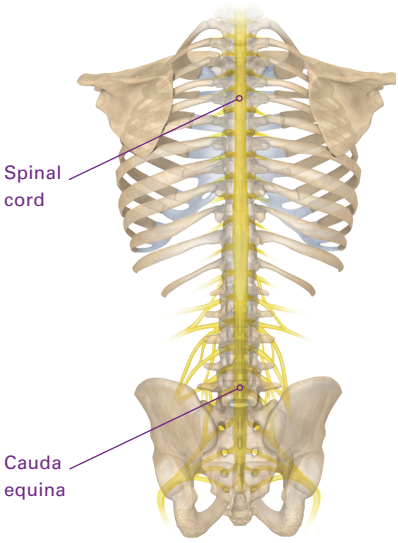


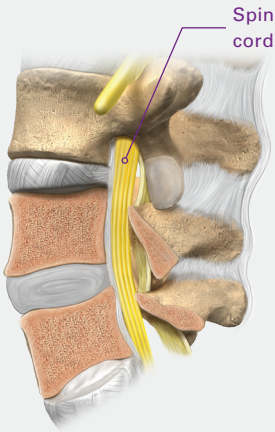
About the spinal cord and cauda equina

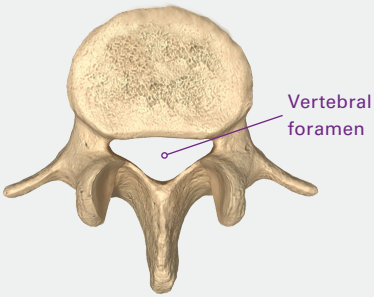
Each vertebra has an opening (vertebral foramen) through which a tubular nervous structure travels. Beginning at the base of the brain to the upper lumbar spine, this structure is called the spinal cord.

Below the spinal cord, in the lumbar spine, the nerves that exit the spinal cord continue to travel through the vertebral foramen as a bundle known as the cauda equina.

At each level of the spine, spinal nerves exit the bony spine then extend throughout the body.







What can cause 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, spinal cord, and/or cauda equina.

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. These bulges or leaks can end up compressing the nerve roots, spinal cord, and/or cauda equina 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 spine, resulting in a bend or curvature, causing symptoms including lower back and/or leg pain.

Degenerative spinal stenosis

Lumbar degenerative spinal stenosis is the narrowing of the bone canal (vertebral foramen) where the spinal nerves and spinal cord pass through the spine. When this narrowing occurs, the spinal nerves and cord are compressed adding pressure which may cause pain and/or nerve damage. Spinal stenosis is typically the result of advanced DDD.

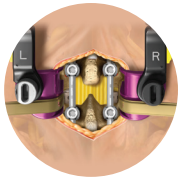
What are the treatment options?

Many symptoms can be treated without surgery including rest, heat, ice, medication, injections and physical therapy. It is important to speak with a physician about the best option.

If symptoms do not improve with conservative treatment, physicians may recommend spinal surgery. Surgery is reserved for those who do not gain relief from non-operative 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 a MAS Midline procedure?

Lumbar interbody fusion is a surgical technique that attempts to eliminate instability in the back. A MAS Midline seeks to achieve this by using a less invasive approach to fuse one or more vertebrae together to reduce their motion.



The distinct difference between a traditional "open" posterior lumbar interbody fusion (PLIF) and a MAS Midline is the medialized surgical approach. The MAS Midline procedure is designed to eliminate the need to retract muscle laterally, therefore requiring a smaller incision than an "open" PLIF. By minimizing the amount of muscle disruption, this procedure is intended to reduce postoperative approach-related muscle pain and enable a faster recovery for the patient.

Can a MAS Midline be right for me?

Your physician might determine a MAS Midline procedure is a good option for you if you require an intervertebral fusion at any lumbar level between L1 and S1, and you would benefit from a less disruptive approach than traditional open techniques.

Conversely, your physician may determine that a MAS Midline 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 to expect

Before surgery

Your physician will review your condition and explain treatment options, including medications, physical therapy, and other surgeries. Should you have any questions regarding the procedure, do not hesitate to ask your surgeon. Your physician will provide thorough preoperative instructions.

During surgery

An individual's surgical procedure and recovery may deviate from what is described herein. This information is not intended to supersede or supplant the information provided by your surgeon.

After you are sedated, positioned on your stomach and surrounded by the appropriate surgical draping, an X-ray image is taken of your spine to identify the location of the operative disc space.

Step 1: Approach

Typically, your surgeon will make a small incision in the center of your back. The size of the incision can vary based on the number of levels and/or complexity of your case. A retractor is used to hold the skin incision open and to provide visibility to the affected areas.

Step 2: Screw placement and decompression

Your surgeon will place screws into the vertebrae that will be utilized at the end of the procedure to provide fixation. Next, your surgeon will remove any bony anatomy that is causing back and/or leg pain in order to relieve compression of the nerve roots.

Step 3: Disc removal and implant placement

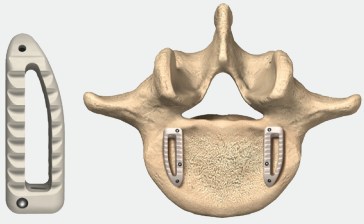
Your surgeon will then remove the damaged disc. Appropriate implants, chosen by your surgeon, will be placed into the empty disc space to restore the proper disc height and assist in spinal load, alignment, and fusion.

Step 4: Fixation and fusion

In order to stabilize the spine, the screws (placed in step 2) will be connected with rods. This stabilization is designed to encourage bone to grow and fuse the vertebrae in the postoperative position.

What implants are used?

This is an example of an implant that may be used during your MAS Midline procedure:



Implant

Implant placement

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. Once the medical staff feels that you are doing well, you will be returned to your room in the hospital.

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. Your physician will also discuss with you any 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.

What are the potential benefits of a MAS Midline procedure?

When compared to traditional open techniques, MAS Midline has:

- reduced blood loss,[1]
- shorter hospital stay,[1]
- smaller incision, and
- less muscle disruption.

1. Goldstein CL, Phillips FM, Rampersand YR. Comparative effectiveness and economic evaluations of open versus minimally invasive posterior or transforaminal lumbar fusion: a systematic review. *Spine* 2016;41:74-89.

What are the potential risks of a MAS Midline procedure?

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 your recovery.

Potential complications following MAS Midline 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 should discuss the incisions that will be made during a MAS Midline surgery.

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

Can I travel?
The implants used in the MAS Midline 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 MAS Midline, please visit:
nuvasive.com

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

If you have any questions about MAS Midline or spine surgery, please call or visit 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.

About The Better Way Back®

The Better Way Back is a nationwide patient support program created by NuVasive®, a leader in developing minimally invasive, procedurally-integrated spine solutions. The Better Way Back is a free community built on the power of empathy, and is dedicated to providing hope, support, and information to individuals suffering from chronic back, leg, or neck pain.

Through its Patient Ambassador Program, The Better Way Back pairs patients considering spine surgery with patients who have previously undergone a spine procedure. Ambassadors volunteer their time to discuss their experiences in order to provide additional, first-hand perspectives.

To learn more about The Better Way Back, please

call **1.800.745.7099**

visit **thebetterwayback.org**

text "TBWB" to **858.360.8292**

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