Anatomy-Conserving Surgery for Low Back and Leg Pain
Introduction

If you are experiencing low back and leg pain, you may have some questions about your options for pain relief. This guide will provide you with information about your condition and possible treatment options. You will see multiple sections designed to help you:

- Recognize your pain and be familiar with a doctor’s diagnostic approach
- Familiarize yourself with multiple low back and leg pain treatment options
- Understand the benefits of one surgical option, the Duo™ Expandable Interbody Fusion System

This guide provides general information on lateral lumbar interbody fusion (LLIF) and the Duo Expandable Interbody Fusion System. This information is not intended to replace any current or future information provided to you by your doctor or other members of your healthcare team.
Low Back and Leg Pain

Back pain is so common in the United States that up to 80% of Americans will experience it during their lives.¹ Often, patients with back pain also experience pain in the buttocks and legs, which may worsen when standing. Pain in the low back and legs can be acute (lasting a few days up to six weeks) or chronic (typically lasting more than three months). Factors such as injury, trauma, genetics, age, health status, disease, infection, and activity level can contribute to low back and leg pain.

Spine Conditions

Your spine is made up of a series of bones (vertebrae) separated by intervertebral discs. The discs connect the vertebrae and allow them to move while also acting as shock absorbers for the spine.

One common cause of low back and leg pain is degenerative disc disease (DDD), which is a natural part of the aging process. When the disc begins to lose height and flexibility, the outer layer (annulus fibrosus) of the disc can tear and allow the gel-like inner core (nucleus pulposus) to bulge or herniate and, in advanced cases, lead to the formation of bone spurs (osteophytes). This can cause compression of the nerves and/or the spinal cord and lead to pain, numbness, weakness, and/or tingling in the low back and/or legs.

Degenerative disc disease can also lead to listhesis, which is when one vertebra slips forward (spondylolisthesis) or backward (retrolisthesis) relative to the vertebra directly below it. This instability is typically caused by degenerative changes but can also be caused by stress fractures, birth defects, and, in some cases, trauma or tumors.
Nucleus pulposus
Annulus fibrosus
Grade I spondylolisthesis
Diagnosing Back and Leg Pain

To diagnose your condition, your doctor may perform some simple assessments of your mobility, ask you to rate your level of pain, and order x-rays of your spine. These assessments can identify where your pain is coming from, determine if you have muscle spasms, and rule out more serious causes of pain.
Treatment Options

In most cases, your doctor will use a conservative (non-surgical) approach to treat your symptoms. Conservative treatments may include rest, heat, ice, medication, injections, and/or physical therapy.

If your symptoms persist after conservative treatment, your doctor may recommend seeing a spine surgeon to explore surgical options. Surgical intervention is reserved for patients whose symptoms worsen or cannot otherwise be relieved. Surgery may also be recommended for specific spinal conditions, such as narrowing of the spinal canal or a herniated disc that has not responded to other treatment.

The Decision to Have Surgery

Choosing the best treatment and deciding whether to have surgery can be overwhelming. To help with your decision, your surgeon may order an MRI, a CT scan, and/or a nerve study to get more information about your condition. After diagnosing the exact source of the problem, your surgeon will review potential treatments with you, which may include additional conservative therapy or surgery. While a variety of surgical procedures may be available, you should discuss the options with your surgeon to learn which one is best for you.
Spine Surgery Options

A surgeon specializing in spinal disorders will perform your procedure. There are many different types of spine surgery. Ultimately, your surgeon will determine which procedure is the best option for you. One common type of spine surgery is lumbar interbody fusion, which involves removing the disc material and replacing it with an implant. The implant restores the disc space to its normal height and provides support and stability while the spine heals. In addition to the implant—which can be made of metal, bone, or plastic—most surgeons will also place screws and rods in the spine to provide additional stability during the healing process.

Lumbar interbody fusion surgery is typically performed from the front (anterior), the back (posterior), or the side (lateral). Your surgeon may modify one of these approaches based on your specific condition and anatomy.

= incision location

Anterior Approach  Posterior Approach  Lateral Approach
Surgical Procedure

Depending on your condition, your surgeon may choose an open surgery or a minimally invasive surgery (MIS).

**Open Surgery** is a more traditional approach during which the surgeon uses an incision large enough to directly view and access your spine to treat your condition. Open spine surgery generally involves muscle and other soft tissue disruption, and removal of bone, which can make your procedure take longer and result in a hospital stay of up to a week. In some cases, an open procedure may be required to properly address your spinal condition.

**Minimally Invasive Surgery (MIS)** seeks to conserve your anatomy and reduce the trauma to your muscles, soft tissues, and bones. The surgeon will make a small incision and work through a narrow channel to treat your condition. MIS surgeries tend to be shorter in duration compared to open surgeries, and since muscle disruption is minimized and bony anatomy is preserved, your recovery may be faster, and you may be able to leave the hospital sooner than after an open surgery.
Lateral Lumbar Interbody Fusion

Lateral lumbar interbody fusion (LLIF) is a type of minimally invasive lumbar interbody fusion surgery in which access to the spine is gained from the side. This allows your surgeon to avoid the major nerves and arteries that surround the spine, reducing the risk compared to other surgical approaches. The LLIF approach also allows your surgeon to restore proper disc height and spinal alignment and may relieve your pain more effectively than other approaches. LLIF does not pose the same level of risk to your major nerves and arteries as other approaches. However, the size of the incision and stretching of muscles and nerves during typical lateral-approach surgeries can lead to new and/or increased pain for several weeks or months following surgery.

LLIF Surgery with the Duo Expandable Interbody Fusion System

The Duo Expandable Interbody Fusion System

The Duo system is an anatomy-conserving approach that offers the latest advancements in lateral lumbar interbody fusion surgery and has demonstrated significant success in reducing pain and restoring function after surgery. Its expandable implant design allows placement in the disc space through a small tube. Once in the disc space, the implant is expanded to its final shape and size to provide spinal support and stability that may relieve your pain.
Amount of retraction required for a Duo procedure (left) compared to a traditional LLIF procedure (right). Note that the Duo procedure requires less stretching of the nerves (yellow) and muscles (red).

Duo’s unique implant and tube design decreases the incision size and reduces the access required to perform the surgery to less than half of that required for traditional lateral interbody fusion systems. This decreased stress on surrounding nerves and muscle may significantly reduce or eliminate the pain and discomfort you may experience following your surgery.
Fast Recovery

Following a Duo LLIF procedure, you will be up and walking the same day or the following day, and you will likely be able to go home within a day or two. Recovery will start immediately and be an ongoing process. Working closely with a physical therapist on correct movement and exercises and following your surgeon’s instructions will aid your recovery. Most patients report significant pain relief immediately after surgery, and you may continue to show improvements in pain and function for up to a year after your surgery.
Pain Relief with the Duo Expandable Interbody Fusion System

The Duo LLIF procedure has demonstrated significant improvement in patient back and leg pain.

According to an ongoing 200-patient study:

95% of patients reported ‘excellent’ or ‘good’ satisfaction six weeks after surgery.\(^3\)

Patients reported a dramatic reduction in back and leg pain.\(^3\)
Is a Duo LLIF procedure right for me?

If you require surgery, your surgeon may determine that a Duo LLIF procedure is a good option for you. Conditions that can be treated with the Duo Expandable Interbody Fusion System include:

- Degenerated discs of the lumbar spine that cause pain in the low back and/or legs
- Spondylolisthesis – Grade I (one vertebra has slipped forward over another)

Having surgery is an important decision, so speak with your surgeon about the best treatment option for your specific condition.
Patient Example

The example below includes images of an actual patient’s spine before and after spine surgery with the Duo Expandable Interbody Fusion System. This patient was a 51-year-old male who was diagnosed with Grade I spondylolisthesis and had not previously had spine surgery. Prior to surgery, he reported experiencing substantial pain in his low back, both legs, and right hip and buttock. He could not walk more than 100 yards.

Six weeks after surgery, he could walk a quarter mile and had resumed normal activities. By his three-month follow-up visit, he had started physical therapy and was able to walk more than a mile. His hip and buttock pain were eliminated, and his back and leg pain were greatly reduced. His recovery continued through his 24-month follow-up visit and no additional treatment was required.*

*Individual results may vary
Potential Risks of LLIF Procedures

All surgeries present risks and complications that are important to discuss with your surgeon prior to your operation. It is important to listen to your surgeon’s guidance before, during, and after surgery. Risks can include problems with anesthesia, persistent pain or symptoms, infection, neurological injury (nerve damage), further progression of an existing spinal disease, pseudarthrosis (non-union), or a problem with the graft or hardware.

The above list is not meant to be inclusive of all potential complications during or after surgery. Consult with your surgeon to discuss all potential risks.

References


For more information about the Duo LLIF procedure, visit www.spineology.com or scan here: