

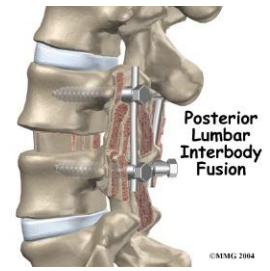
# Posterior Lumbar Instrumented Fusion

## What is a lumbar fusion?

A lumbar fusion is a procedure in which two or more vertebrae in the lumbar spine are fused together. The purpose of the procedure is to relieve the pressure on the nerves, restore the normal alignment of the spine, and provide stabilization.

## What is a TLIF?

This essentially just refers to the approach of the lumbar fusion. It stands for transforaminal lumbar interbody fusion. Through this approach, both the anterior and posterior portions of your spine can be fused.



- TLIF increases the chance for a successful fusion due to the larger area for bone graft placement. Bone graft can be placed both in the area behind the vertebrae, to the side of the vertebrae, and in the disc space between the vertebrae.
- Because the approach to your disc space and spinal canal with TLIF is from your side, this allows your doctor to perform the operation with minimal stretching of your nerve roots. The exposure of your spinal canal is done from one side only.
- TLIF uses a special spacer that is placed between your vertebrae to help restore the space between the vertebrae (the disc space). This can help reduce irritation and pressure on your nerve roots from bone spurs and thickened ligaments that can be a source of leg pain.

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## What happens during the procedure?

Once you are taken back to the operating room, you are put to sleep with general anesthesia. Once you are asleep, we will gently position you face down on the operating bed (Figure 1). The bed has an open space for your abdomen to relax, this reduces blood loss during the procedure. A vertical incision is made in the middle of your low back at the area of your spine surgery. Your skin, muscles, and soft tissues will be gently pulled aside (Figure 2). The spinal canal and space where the nerve passes through is opened up by removing small pieces of the vertebrae. This is the laminotomies and foraminotomies part of the procedure (You will see both of those words on your consent form). This alleviates the pressure from the nerve roots and the sac filled with nerves. In most cases, the disc is completely removed (discectomy). The space is completely cleaned out and the top and bottom surface of the vertebrae between the disc space is scraped to stimulate fusion of the bone graft that will be placed in the space (Figure 3). The space is measured and the matching size spacer or cage is used.



Figure 1 ©DePuy Synthes Spine, Inc. 2003-2012

First, bone graft material is packed into the front part of the disc space (Figure 4), then the interbody spacer or cage is inserted (Figure 5). The screws are inserted through the pedicle bones of the vertebrae and a rod is attached to the screws on both sides with an x-ray machine to guide the placement (Figure 6). Then bone graft is added along the sides and back of the vertebrae for more stabilization.

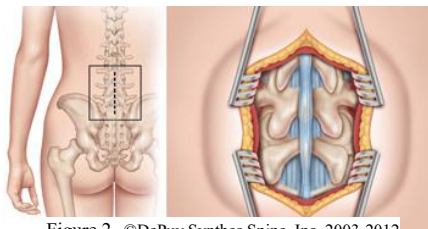


Figure 2 ©DePuy Synthes Spine, Inc. 2003-2012

The disc is completely removed (discectomy). The space is completely cleaned out and the top and bottom surface of the vertebrae between the disc space is scraped to stimulate fusion of the bone graft that will be placed in the space (Figure 3). The space is measured and the matching size spacer or cage is used.



Figure 3



Figure 4



Figure 5

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Figure 6

Near the lumbar incision, a small separate incision is made over the top of your iliac crest. Bone is taken from the area using tools to scoop the bone out of the crest and prepared for use in the fusion (Figure 7). It is common to have pain at the bone graft site that will improve but may last for several months. You will have the option of choosing the left or



Figure 7

right side as long as surgery was not performed at the area previously. In general, we recommend choosing the opposite side of which you sleep. At the end of the surgery two small catheters are placed near the incision. The tubes are connected to a device that looks like a small ball filled with local anesthetic (Figure 8). The device will slowly infuse the local anesthetic to the surgical area to help with some of the post-surgical pain and soreness. The ball is placed in a carrier to allow you to move around with it. The catheters are removed before you leave the hospital.



Figure 8

### What is surgical monitoring?

Surgical monitoring is used during surgery to monitor your nervous system. This is done by a neurophysiologist. If you have undergone an EMG before, it is very similar, except more electrodes are placed. In prep and holding, you will meet the surgical neurophysiologist and a brief neurological assessment will be performed. They will apply electrodes to various parts of your body including your arms, legs, and head. Some electrodes may be applied while you are in prep and holding and the remainder are applied after you are asleep in the operating room. The electrodes are connected to the neuromonitoring equipment and your nervous system is analyzed closely during the surgery. The neurophysiologist will alert the surgeon if any changes occur. The electrodes will be removed once the surgery is complete, before you completely wake up.

### What are some of the risks related to the surgery?

The risks of the procedure include but are not limited to: medical complications including heart attack, stroke, and blood clots, there is a risk of worsening of nerve related symptoms including weakness, numbness, tingling, or burning. There is a small risk of hematoma formation, implant loosening or breakage, failure of instrumentation, and wound breakdown. On occasion, this means that a patient has to be taken back to the operating room. There is a risk of infection which may occasionally require removal of the instrumentation. There is a risk of not fusing, known as non-union or pseudoarthrosis, sometimes requiring revision surgery, note this risk almost 50% in smokers. There is also a risk that the level directly above or below the fusion will progress to the same issue as the level(s) treated.

### Does a revision lumbar fusion carry the same risks as an initial lumbar fusion?

No. Revision surgeries have a substantially higher risk of complications than an initial surgery. This is largely because of scar tissue formation and the distortion of the normal spine anatomy, which increases the risk of spinal fluid leakage from a hole in the covering of the nerve roots. The success rates are also decreased in revision surgery. There is a higher possibility of having pain and neurologic symptoms long term, because it is more difficult to restore function.

### How long is the hospitalization?

You will be in the hospital for at least two nights. Your discharge will largely depend on you and how well you are doing. During your hospitalization, you will be evaluated by a physical therapist. They will make recommendations based on your performance, such as a rolling walker, inpatient rehabilitation, and home physical therapy. Social work will make arrangements if any of these are required during the discharge planning process. If you are doing well and cleared by physical therapy, no physical therapy is necessary until approximately four weeks following surgery.

## How long is the incision?

Typically the incision ranges from about 3-6 inches depending on the number of levels being fused. The incision over your iliac crest is around 2 inches. The incisions are usually closed with dissolvable sutures and steri-strips are placed over the incision. Some patients may have external sutures which will need to be removed approximately 10-14 days following surgery.

## What happens immediately after surgery?

You will be taken to your room, usually on the 7<sup>th</sup> floor, from recovery. You will be able to start drinking several hours after the surgery and begin eating small amounts later on if tolerated. Nausea is very common after surgery. Usually patients are up and moving around towards the end of the day of your surgery or the next morning. Don't forget to bring your brace with you.

## What will my pain be like after surgery?

Everyone handles pain differently after surgery. In general, patients who are using a high dosage of narcotics prior to surgery will experience more pain after surgery due to increased tolerance. If you have chronic pain, you will be dealing with post-surgical pain in addition to your chronic pain. You will have a continuous rate of local anesthetic going to the surgical area as well as a PCA (Patient Controlled Analgesia) which will allow you to have some control of the amount of pain medicine you receive. We try our best to keep your pain at a tolerable level, however, remember we also need to keep your vital signs stable. Too much narcotics can cause a drop in blood pressure and heart rate.

## Will my symptoms completely go away after surgery?

Not all patients get complete relief with this procedure. Please remember this surgery is extensive and carries moderate success rates. As with any surgery, you should expect some increase in pain due to the actual procedure. You will be discharged with pain medication to help make the pain tolerable, however, post-surgical pain may not be completely alleviated until you fully heal. It may take up to a year to see improvement in your preoperative symptoms. Some patients may need to be referred to a pain center for long term pain management.

## What can I expect after surgery?

- **Nerve pain:** It is normal to have increased nerve pain after surgery due to inflammation from the surgery, this will improve over several weeks once the inflammation begins to decrease. It is also not unusual to get an increase in nerve pain 1-2 weeks after surgery, this is typically attributed to the steroids given during and after surgery completely wearing off and increased activity. Ice packs will help to reduce the inflammation.
- **Muscle spasms:** Muscle spasms in the low back and legs are common after surgery and usually decrease after a few weeks. Heating pads will help to relax the muscles.
- **Soreness/Numbness:** It is normal for the incision to be sore for a few weeks after the surgery. The incision will start to itch shortly following surgery, this is a sign of healing. It is also normal to have some areas of numbness around the incision because there are some sensory nerves that are cut with the incision. The numbness will sometimes take several months to improve. It is also normal for the numbness to increase during the first few weeks following surgery. As the nerves regenerate, some people may experience occasional shooting pain, dripping sensation, or tingling near the incision.
- **Lethargy:** All patients are tired when they return home and need frequent rest during the day. Even simple activities of daily living such as showers may make you feel more tired. Though we do not want you to lie in bed all day, it is okay to rest numerous times throughout the day. It is important to walk as much as you can tolerate, remember one of the risks after surgery is clots to the legs. Staying in one spot for too long will increase this risk. Walking should start slowly at a comfortable distance and then gradually increase as tolerated. Remember to try not to overdo it, this will only set you back. Due to the overall tiredness, you may find yourself a little more irritated or aggravated with things than usual, this is normal and will get better.

## How long is the recovery period?

Recovery for this surgery is about 3-4 months. Majority of the fusion occurs within the first three months of surgery. It will take up to a year to completely fuse and may take up to a year to see improvement in symptoms.

## What are some of my restrictions after surgery?

You will be given detailed discharge instructions outlining the dos and don'ts after surgery. A few of the main things are:

- **No Driving-** You are restricted from driving during the first month following surgery. At your first postoperative visit you will undergo x-rays of your lumbar spine at the imaging center attached to our building (Papastavros). These x-rays will be reviewed during your visit and if everything looks good some restrictions, including driving will be lifted.
- **No Lifting-** Lifting should be limited to less than 5lbs, this is about a gallon of milk.
- **No Flying-** Flying is not recommended during the recovery period until you are at least 6-8 weeks following surgery.
- **Caution:** Use caution with bending, twisting, or turning. Be sure to use the lumbar brace for support when you are up and walking.

## When can I return to work?

The range of patient's being out of work is anywhere from 6-12 weeks. A lot of this will depend the type of job you have and how you are recovering. Some patients are able to return early on light duty with reduced hours. Remember, everyone heals differently. We will discuss the plan for return to work at your first postoperative visit

## How long do I have to wear the brace?

You should wear your brace when out of bed until your first postoperative visit. We will review your postoperative x-rays and if it demonstrates evidence of healing, you will be able to wean off the brace at that point.

## Why do I have to use a bone stimulator?

The bone stimulator has been proven to increase fusion rates. It is not like a TENS unit, you won't feel it. The bone growth stimulator uses a low-strength pulsed electromagnetic field to increase your vascular supply. A strong blood supply is required by the body to create new bone. Typically it is recommended to wear the stimulator every day for at least 3-4 months following surgery.

## What about outpatient physical therapy?

If you did not require inpatient rehabilitation or physical therapy, outpatient physical therapy is not recommended until after your first post-operative visit. This allows time for the fusion to start. The length of therapy will depend on your symptoms and your progress.

## Will I lose my mobility with the surgery?

You will lose some mobility however, this largely depends on how many levels you had fused and what your flexibility was prior to surgery. Majority of patients will not notice the decrease in mobility. Most of your motion occurs at the hips when you bend over at your waist.

## What type of metal is the instrumentation made of?

The screws and rods are titanium. This means you are safe to undergo MRIs and typically will not set off security metal detectors.

## Will the screws and rods need to be taken out eventually?

The screws and rods are used to hold the spine in place while new bone is growing. Once you are completely fused (generally about 1 year following surgery), the new bone takes the place of what the screws and rods were doing and provides stabilization. After complete fusion has occurred the instrumentation really doesn't serve a purpose anymore, however, it typically doesn't cause any problems or pain so it is left alone.

## Does smoking have an effect on my fusion?

YES! Smoking significantly increases your risk of not completely fusing. Incomplete fusion or non-union will increase the likelihood of worsening or persistent symptoms, requiring subsequent revision surgery. Smoking also increases the risk of infection and medical complications under general anesthesia and after surgery. Please see our smoking section.