

## Lumbar Fusion for Degenerative Disc Disease

### Overview

A lumbar fusion is a type of back surgery that places bone either in the front (disc space) and/or along the back (posterolateral gutter) of the spine so that the bone grows together and fuses the spine. Fusing the spine is designed to decrease back pain by limiting the motion at a painful motion segment.

The fusion is not actually completed at the time of surgery. Instead, the conditions for the spine to fuse are created and the fusion will set up over a three to six month (and up to 18 month) period of time following the spinal surgery.

Lumbar fusion (or spinal fusion) for back pain caused by degenerative disc disease is an option for patients who:

- Have failed to get better after extensive conservative treatment (such as physical therapy, medications)
- Continue to have back pain that limits their ability to function
- Have received a diagnosis that a specific disc space is the pain generator.

Importantly, other possible causes of back pain need to be considered and ruled out prior to the fusion surgery. It is important to note that the decision to undergo a fusion procedure for back pain is entirely the patient's decision and he or she needs to weigh the risks and possible complications, as well as alternatives to a fusion procedure.

### Indications for lumbar fusion surgery

Fusion surgery is best at treating back pain caused by severe degenerative disc changes and is best for treating one, or maybe two, levels of the spine (e.g. L4-L5 level or L5-S1 level). There are definitely patients who have experienced dramatic improvements in their activity tolerance and function due to a successful fusion surgery.

Two key factors that impact on whether or not a fusion procedure will be successful include proper patient selection and obtaining a solid fusion.

**Proper patient selection** The most difficult and crucial part of any type of back surgery is selecting the patients who will do well with a certain

procedure. It is especially critical to select the right patients for a lumbar spine fusion for many reasons. Healing from a fusion procedure takes a long time (about three to six months, and up to 18 months). The fusion forever changes the biomechanics of the back by increasing the stress placed on the other (non-fused) joints in the spine. And finally, it is absolutely imperative that the pain generator is identified prior to surgery and that this anatomical structure is included in the fusion. Various tests such as MRI, myelogram or discography are commonly utilized to identify the painful motion segment.

**Obtaining a solid fusion** Technically it is difficult to achieve a spinal fusion. Screws, plates or rods are used to increase the chance of achieving a spinal fusion, that is, to promote the healing of bone graft that is harvested from the sidewall of the pelvis. If screws are used to stabilise the fused level then a fusion can be expected in about 90% of cases, however, this reduces to about 65% if you are a cigarette smoker. For this reason cigarette smokers are advised to stop smoking prior to surgery. Achieving a solid fusion is paramount to the success in this surgery because if the bone graft does not take and motion continues then the symptoms are not altered by the surgery (indeed made worse by the surgery).

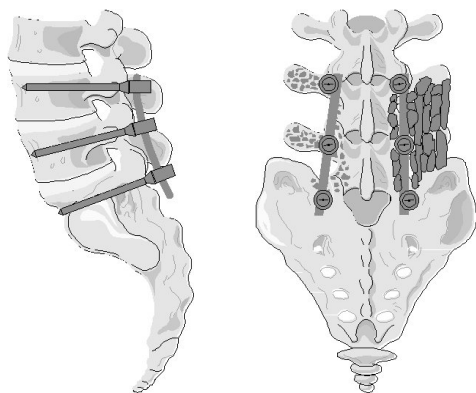
### Complications

The surgery is complex and often lengthy taking three to five hours. There is moderate blood loss and the rehabilitation period is often long. There is a 2% to 5% chance of infection, and should this occur postoperatively antibiotics are prescribed. It is uncommon for there to be long-term consequences from this. There is a 1 in 1,200 incidence of neurological complication during or after the surgery, which may involve a single nerve root manifesting with some weakness, perhaps a foot drop, but occasionally the neurological problem is more severe involving the bowels, the bladder, or even significant weakness of the lower limbs. Whilst neurological complications are very rare they do occur, and this must be taken into consideration prior to surgery. Other rarer complications can occur notably thrombosis in the lower limbs (blood clots) which can travel to the lungs causing pulmonary embolism. Of course there are a number of anaesthetic related complications that occur from time to time.

*In short, spinal fusion surgery is a major undertaking* associated with infrequent, but sometimes significant, complications and these must be taken into consideration prior to proceeding with spinal fusion.

## Results

The results of spinal fusion surgery are good or excellent in 80% of patients, that is, there is a significant reduction in symptoms (although the symptoms may not be totally cured). 20% of patients report that they get no benefit from the surgery, or are made worse. Of the patients that improve some gain a complete cure, however, the vast majority have a reduction of their symptoms, usually a significant reduction, but it must be understood that spinal fusion is not a panacea and its goals are to reduce symptoms rather than achieve a cure. Of the patients that don't benefit from the surgery about half of these demonstrate a clear reason why they have not benefited, that is, the bone graft has failed to unite. In these patients the symptoms usually deteriorate and their pain is worse and often further surgery is required to correct this problem. There is a small group about 10% to 15% that do achieve a solid spinal fusion but continue to have symptoms. It is not clear why these patients continue to have pain and it is very difficult to help these patients in the longer term. In short, one has to be aware 20 - 25% of patients are not improved with the surgery and this group would have been better had they not undergone the surgery in the first instance



Diagrams show pedicle screws and rods fixating the spine with posterolateral graft. Often interbody graft and/or cages (not shown) are used in conjunction with the posterolateral graft.

There are a number of diagnoses such as spondylolisthesis of the lumbar spine, both following laminectomy or due to a pars defect, that do extremely well with spinal fusion surgery and have a significant reduction of symptoms in 90 - 95% of cases. This group seems to do much better.

For these reasons patients should only undergo spinal fusion surgery as a last and final option when all other methods of treatment have failed to reduce the symptoms of low back pain. There is no doubt that many patients benefit from spinal fusion and are made much better by this type of surgery, however the results are unpredictable and thus a decision to proceed with surgery should not be made lightly.

## Post operative instructions

1. Check incision daily for the following: Green/yellow discharge. Increased redness and/or tenderness at incision site. Opening of the incision. Flu-like symptoms. Temperature above 38 degrees. If any of the above should occur, please contact your doctor.
2. Your bandages will most likely be removed before you leave the hospital, if not, they should be removed seven days after the surgery.
3. You may shower after the bandages are removed. It is recommended that a shower chair be used for the first few weeks to ensure your safety. (This will be arranged for you before your discharge, if required.)
4. The incisions should be cleaned gently using regular soap and water. Do NOT use heavily perfumed soaps. **RUB GENTLY!**
5. If you were given a brace to wear postoperatively, it should be worn whenever you are up and out of bed. It should NOT be worn at night while you are sleeping. If you need to go to the bathroom in the middle of the night you do NOT need to put it on.
6. You should NOT drive until seen in the office for your first postoperative visit. You may be a passenger for short distances (20-30 minutes). If you must travel for a longer period, be sure to make several pit stops so that you can stretch your legs. Reclining the passenger seat will be the most comfortable position for you.
7. Do NOT sit for periods longer than 20-30 minutes. You may increase this time as you become more comfortable.
8. **DO NOT DO THE FOLLOWING:**
  - Lift anything greater than 4 kg.
  - Bend or twist at the waist
9. DO walk as much as possible. Stairs are good for you, but take it slowly. You may also use a treadmill. No running. If you were discharged using a walker and/or cane, you may stop using these assistive devices once you feel safe and comfortable.
10. If your incisions have sutures or staples, they may be removed 10-12 days following your surgery by a visiting nurse or your family doctor.

I trust this information is helpful to you, but please feel free to ask questions.