

**Lumbar Spine Disorders: \_\_Disc Herniation, \_\_Stenosis, \_\_Degenerative**

90% of people will have at least one episode of significant back pain in their lifetime. Most of these episodes resolve on their own, usually within three months. A small number of these people continue to have problems and require some form of treatment to improve their symptoms.

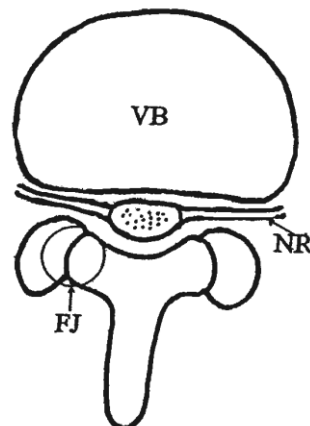
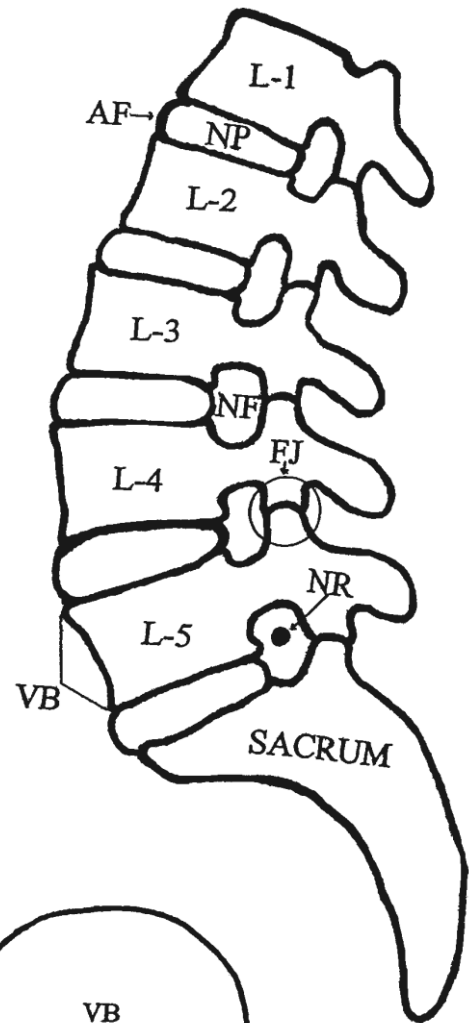
There are many different causes of back pain. In order to understand the various problems that can occur in the lumbar spine [lower back], you must first have an understanding of the anatomic structures involved.

The lumbar spine is composed of five bones called lumbar vertebrae. They are numbered 1 to 5 from the top to the bottom. They are referred to by their number. L1 is the top bone and L5 is the bottom bone. The lumbar spine connects to the pelvis through the sacrum [S]. The vertebral body [VB] is the large, weight-bearing part of the spine. The bones are connected to each other by ligaments muscles, and discs.

The disc is made up of two parts. The tough outer part of the disc is called the annulus fibrosis [AF]. It provides the strength of the disc. The soft inner part of the disc is called the nucleus pulposus [NP]. It acts as a shock absorber and also helps to maintain the height of the disc.

Motion is allowed between the vertebrae by two structures. In the front of the spine, motion occurs at the level of the disc. In the back of the spine, motion occurs through small, flat joints called facet joints [FJ].

The spinal nerves lie behind the vertebral bodies and discs and are protected on their back side by an arch of bone. The spinal cord ends at approximately the L1 level. The nerves going to the legs sprout off of the bottom of the spinal cord. These nerves are called nerve roots [NR] and are named after the vertebrae above them. For example, the L4 nerve root exits the spine between the L4 and L5 vertebrae. The hole through which the nerve root exits the spine is called the neural foramen [NF].



**Cross section of the Lumbar Spine**

[As would be seen on a CT scan or MRI]

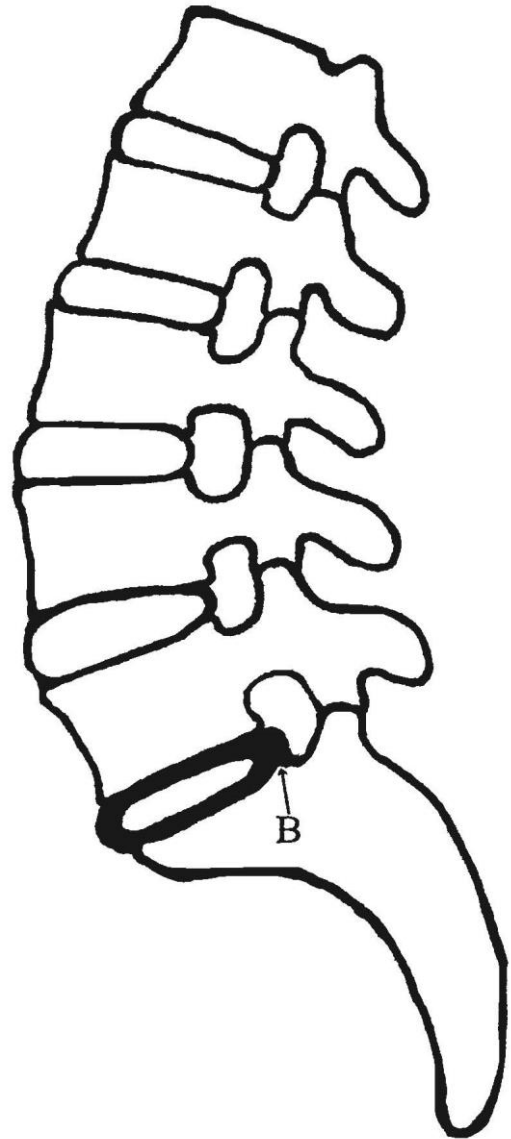
## Defining the Problem

Of all the parts of the lumbar spine, it is the disc that leads to the majority of problems that can cause impingement of the nerves. The lumbar disc's main function is to provide a strong but stable connection between the vertebral body above and below it. It functions as a joint in the front of the spine. Like many other joints in the body, it can be injured. This can occur quickly because of a traumatic accident or slowly wear out over time as a process of aging. A worn out disc is called a degenerated disc. Not all degenerated discs cause problems, and in some respects disc degeneration is considered a normal part of the aging process. However, in some people, the damaged or degenerated disc can cause pain or weakness by placing abnormal pressure on nerve roots [nerve impingement] going to the legs.

## Degenerative Disc Disease

Degenerative disc disease is a condition in which the parts of the disc that allow them to be strong, plump shock absorbers become damaged. The damage can occur in the nucleus pulposus and/or the annulus fibrosus. Because of this damage, the disc loses its ability to hold water and slowly dehydrates. When the disc dehydrates it loses some of its height.

This causes the tough outer part of the disc to bulge[B] into the spinal nerve area [the spinal canal]. The loss of disc height places increased stress on the facet joints, which can lead to arthritis of these joints. Pain is thought to originate from the nerves going to disc. The patient usually experiences back pain, which might go into the buttock. Pain going down the leg, especially if it goes past the knee, is not from the disc itself. Leg pain comes from irritation of the spinal nerves and is a separate but related issue to disc degeneration.

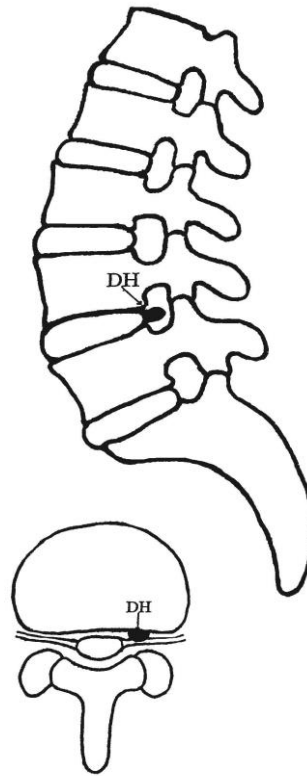


**Degenerative Disc**

## Lumbar Disc Herniation

A herniation is when the inside of a structure is pushed to the outside of a structure through a hole that should not be there. When the soft central part of a disc is pushed out through a hole in the tough outer part of the disc, it is called a disc herniation [DH]. If this occurs on the back side of the disc, the herniated piece of disc can put pressure on the spinal nerves. This can cause several problems. Some people experience pain in their lower back which spreads down their hip, buttock, and into one or both legs.

When the herniated piece of disc pushes on a nerve root to the right or left, it can cause pain which shoots down the right or left leg respectively as well as possibly muscle weakness. If the piece of disc is large and more central in location, it can push directly on the nerve roots in the spinal canal and cause symptoms in the legs of shooting pain, weakness, leg clumsiness, or a decrease in balance with walking. The symptoms which are experienced can be quite variable between patients ranging from very mild to incapacitating.

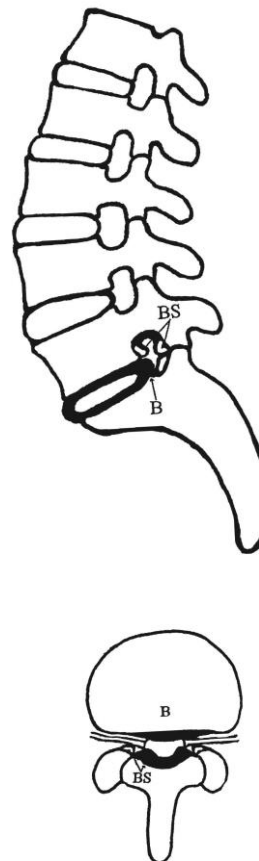


Herniation Diagram

## Lumbar Spinal Stenosis

Spinal stenosis is a condition in which the bone tunnel in which the spinal cord lies becomes too small because of degenerative changes to the disc and facet joints. When the disc degenerates it loses height. This causes the tough outer part of the disc to bulge [B] into the spinal cord area [the spinal canal]. The loss of disc height places increased stress on the facet joints, which can lead to arthritis of these joints. These changes cause the vertebral bodies and facet joints to make bone spurs [BS] which crowd in on the spinal cord and/or the nerve roots. The bone spurs can pinch the nerve root in the neural foramen as the nerve exits the spine. The bone spurs and bulging disc pushing on the spinal cord can cause arm symptoms as well as pain and weakness in the legs, loss of balance with walking, and loss of bowel and bladder control. Symptoms between patients can be quite variable ranging from very mild to incapacitating.

Some people develop spinal stenosis secondary to what is called a degenerative spondylolisthesis. A spondylolisthesis is when one vertebral body slides forward on the one below it. The combination of the abnormal position of the vertebral bodies and bone spurs can cause a pinching of the nerves as well as back pain.



Degenerative Disc

## How is Spinal Disease Diagnosed?

### X-Ray

X-rays show bone well but do not show soft tissues like discs. They can show bone spurs but do not give enough information to be able to judge the degree of neurologic impingement. They can give us the big picture of the overall health of the spine and are useful for diagnosing instability between spinal segments.

A facet block is a procedure in which an interventional pain specialist places a mixture of steroids and local anesthetic into one or some of the facet joints in the cervical spine. This procedure is done for two reasons. One reason is to try to localize the specific joints that are causing your pain. The other reason is that the medicine in the injection often provides significant pain relief for a patient while he or she is in therapy. Sometimes the steroid can provide long term relief of pain for patients.

### CT Scan

Computed Tomography or CAT scans use x-rays to generate 2 dimensional pictures of the spines. It demonstrates bone spurs very well. Sometimes the CT scan is combined with myelogram in which x-ray dye is placed in the fluid around the spinal nerves. This then allows the CT scan to demonstrate where the bone spurs and soft tissues are pressing on the nerves. People with cardiac pacemakers and aneurism clips can have a CT scan.

### Selective Nerve Root Blocks

A selective nerve root block is procedure performed by an interventional pain specialist in which, under fluoroscopy [live video x-ray], a needle is placed next to a single nerve root, such as the left L4 nerve root. A small amount of local anesthetic and cortisone [steroid] is placed around the nerve root. This procedure is done for two reasons. The local anesthetic works immediately and wears off in a few hours. If the patient experiences relief of his or her symptoms during this time period, it confirms that the nerve root which received the block is indeed the location of the problem. It is important to remember how you felt for the first hour after the injection and report this to the doctor who ordered the test on your follow-up visit. The cortisone which is placed with the local anesthetic decreases the inflammation around the nerve. This can provide partial or lasting symptoms relief in some patients. The steroids usually take a day or two weeks to start working if they are going to help.

### Lumbar discography [discogram]

A discogram is a procedure in which a doctor places a needle into the center of the disc or discs that are thought to be the source of the back pain. A needle is also placed into a disc that is thought to be normal. The correct placement of the needles is confirmed by fluoroscopy [live x-ray]. The doctor then injects x-ray dye into the disc. This achieves two things. First, it can demonstrate the disc damage by showing abnormal flowing of the dye inside the disc as well as possibly leaking of the dye out of the disc. The second aspect of the procedure is the key part of the test. When the doctor injects the dye, it creates pressure in the disc. If this pressure reproduces the back pain the patient has been having [concordant pain], the test is thought to be positive and that the degenerated disc is the source of the patient's pain. If the injection causes no pain or the pain is different from their usual pain [discordant pain], the test is negative and the disc is thought to not be the main source of the patient's pain. The patient is not told which disc [the normal or degenerative disc] is being injected first so as to be comfortable and some doctors will give medicine to the patient. You are given medicine is given. The procedure is done under sterile conditions, but there is still a small risk of an infection from the procedure as there is with any invasive diagnostic procedure.

# Lumbar Disc Herniation

## Do I Need Surgery?

If your pain is uncontrollable, you might need surgery. For those patients with incapacitating pain, return to work may be faster and overall recovery faster with surgery. That being said, if the pain is tolerable with nonsurgical treatment, the long-term outcomes are the same for the patients who chose surgery compared with those who do not [Weber H; Lumbar disc herniation; a controlled, prospective study with ten years observation. *Spine* 1983; 8:131140]. Non-operative treatment of lumbar disc herniations consists of physical therapy, chiropractic, medication, and possibly cortisone [steroid] injections. As long as your symptoms are improving, surgery is not indicated. If your symptoms do not improve with non-operative treatment or your improvement has stopped at a level you cannot live with, surgery is a reasonable consideration. Most people that do not need surgery have good improvement of their symptoms in the first 6-8 weeks. Surgery done within the first 6 months of injury has a better average outcome than surgery done after 6-12 months of symptoms [Orthopedic Knowledge Update, Spine 2, p.328]. It is controversial whether prolonged irritation of the nerve root from a disc herniation can lead to long-term or permanent nerve damage.

## When is it Reasonable to Consider Surgery?

1. When your leg pain or weakness cannot reasonably be controlled with medications, physical therapy, chiropractic, and/or cortisone [steroid] injections. Pain is the most common reason people have surgery for a disc herniation. Only the patient knows best how much pain or weakness he or she is having and if they want to have something done about it.
2. When your symptoms last longer than 6-8 weeks and keep you from doing what you enjoy doing or are preventing you from working or having a good quality of life.
3. When your disc herniation has caused significant weakness in your legs. Leg weakness is not an absolute indication for surgery.
4. When your symptoms seems to get better but keep returning when you do your job or other things you enjoy doing and prevent you from having a good quality of life.
5. If you have lost bowel or bladder control or have increasing weakness because of your disc herniation, surgery is indicated.

## What Kind of Surgery is Done for Lumbar Disc Herniations?

The most common surgery done for lumbar disc herniation is called a lumbar discectomy. When performed through a small skin incision with the addition of an operating microscope, it is called a microscopic lumbar discectomy. The procedure begins with a one inch incision over the affected disc. The muscles over the spine are pulled to the side to gain access to the arch of bone protecting the spinal nerves. A small window is made in the bone over the disc herniation. The nerve root is identified and protected. The herniated fragment of disc is then removed. Other loose pieces of disc found at the time of surgery are also removed. The wound is then irrigated with saline and closed in layers with sutures.

## What Are the Results of Surgery?

Many studies have been done on the outcome of patients undergoing surgery for a lumbar disc herniation. ON AVERAGE, about 80-94% of patients will have a good or fair outcome [The spine Rothman and Simeone, fourth edition, p.1760].

Approximately 10% of patients will have a new disc herniation [recurrent disc herniation] at the same level. The highest risk of having a recurrent disc herniation is in the first six weeks after surgery. This is why patients are restricted from heavy lifting during this phase of their recovery. Surgery performed for recurrent disc herniations has an approximately 10-20% lower rate of good outcomes compared to the first surgery.

## What is the Recovery Period Like?

For a single level lumbar discectomy most patients can go home the same day. Patients that have two or more level surgery occasionally stay in the hospital overnight. It is very rare to require a blood transfusion after surgery as most of these surgeries have only a small amount of blood loss.

The pain from surgery is greatest for the first 1 to 3 days after surgery and slowly improves from there. Pain is usually controlled by narcotic pain medicine [pain pills]. About 40% of patients are off their pain pills within 10 days. Patients who have a fusion in addition to their decompression usually take pain medicine a little longer. Your first follow-up appointment will be 6 weeks from the time of surgery.

Restrictions after surgery consist of no lifting over 15 pounds for 6 weeks.

You are allowed to drive when you can move freely without the use of pain pills. You are not allowed to drive while taking pain medicine.

You can return to work when your symptoms allow. Most people take about 1-2 weeks off work. If your job requires heavy lifting, you will need to be put on sedentary duty status with a 15 pound working restriction for 6 weeks after returning to work. You should not work if you are taking enough pain medication to affect your judgment or reaction time. Work status is regularly updated based upon your function.

You will be allowed to get your wound wet in a brief shower the day following surgery. Dressings are removed at that time.

# Degenerative Disc Disease

## Do I Need Surgery?

It is important to know that disc degeneration is very common and the vast majority of people do not need surgery simply because they have degenerated discs. As we get older, our risk of disc degeneration increases. If you did an MRI on 100 random people over 30 years of age, you would be able to find a degenerated disc in over half of them, but most of them would not have had long-term problems from them. In many ways disc degeneration is a normal part of aging. The problem arises in patients who have degenerated disc and a large amount of back pain. At the present time, a discogram is the best way to prove that the disc is the cause of the pain but the test is not 100% accurate, and its use for diagnosing back pain has been controversial. There are some patients who clearly benefit from surgery for their degenerated disc and others who do not. Your doctor will do his best to tell you if you are a good candidate for surgery but it is impossible to guarantee perfect results. Some people who appear to be the perfect patient for the surgery only have partial relief of their pain, and some people have no relief at all. Add on to this the risk of surgical complication and you can understand that the decision to have surgery should be taken very seriously and with careful thought.

The cornerstone of non-operative treatment for a degenerated disc is physical therapy and anti-inflammatory medication. Whether or not the patient has surgery, he or she should be involved in a lumbar strengthening at home exercise program. If the patient is overweight, they should try to see if weight loss will improve their back pain. Smoking increases a person's risk of back pain and is known to be bad for discs, so it is recommended that patients stop smoking as well.

## When is it Reasonable to Consider Surgery?

1. Consider surgery when your back pain has lasted for at least 4-6 months, has not improved, and cannot reasonably be controlled with medications, physical therapy, and/or weight loss if needed. Only the patient knows best how much pain or weakness he or she is having and if they want to have something done about it.
2. When your symptoms last longer than 4-6 months and keep you from doing what you enjoy doing or are preventing you from working or having a good quality of life.
3. When your symptoms seems to get better but keep returning when you do your job or other things you enjoy doing and prevent you from having a good quality of life.

## Is there Controversy Among Spine Surgeons about the Indications for surgery on Degenerative Disc Disease?

Yes. If you see several different doctors, you will hear a wide range of opinions. Some spine surgeons never operate on a degenerative disc if the patient's only symptom is back pain. Some surgeons operate on it all the time and think that surgery is a good solution to the problem.

## What Kind of Surgery is Done for Degenerative Disc Disease?

The most common surgery done for degenerative disc disease is called a lumbar fusion. This is a process in which the two vertebral bones are turned into one bone by placing small pieces of bone between them. Over 3-6 months, the two bones heal into one. A fusion can be done from the front of the spine through an incision over the lower abdomen or through an incision on the back. In some cases the fusion is done on both sides. If you decide to have surgery, your surgeon can help you decide which type of fusion would be best for you.

There are also several motion preserving devices such as disc replacement, which may be options for you. These are devices which provide stability through the implant and surrounding structures of the anatomy. It is thought these devices may perform better long-term than fusion in select cases. These devices are controversial in the spine world and these options will be discussed if you are a candidate.

## What Are the Results of Surgery?

There are two types of results that are looked at when it comes to spinal fusions. The first is the percent of people successfully obtaining a fusion. With modern techniques, fusion rates average around 90%. The second and more important result is how much pain improvement the patient has after surgery. This is much harder to predict and is a result of how well the surgeon picked the people that would benefit from this type of surgery. It is good to keep in mind that there is no guarantee of successful outcome even when every effort has been made to do so. This is true regardless of who does your surgery or how they do it. A reasonable expectation for most patients is that their pain will be improved but not totally removed.

Some people who have surgery will later have degeneration of the spinal level above or below the level or levels they had surgery. Those who have a fusion, especially if it is over several levels, are at an increased risk of this. Just because another level degenerates doesn't mean it will be painful or that you will need more surgery. However, some people end up needing more surgery to correct problems that develop at other levels.

## What is the Recovery Period Like?

For lumbar fusion, patients are usually in the hospital for 1-3 days. If you have a complication, it could be longer.

Few people require a blood transfusion for a one or two level fusion.

The pain from surgery is greatest for the first 1 to 3 days after surgery and slowly improves from there. Pain is usually controlled by narcotic pain medicine [pain pills]. About 50% of patients are off their pain pills within 6-12 weeks. Your first follow-up appointment will be 6 weeks from the time of surgery.

Restrictions after surgery consist of no lifting over 15 pounds for 6 weeks. Work status is updated regularly thereafter and based upon function.

You are allowed to drive when you can move freely without the use of pain pills. You are not allowed to drive while taking pain medicine.

You can return to work when your symptoms allow. Most people take about 6 weeks off work. If your job requires heavy lifting, you will need to be put on light duty status with a 15 lb working restriction for 6 weeks after returning to work. Some restrictions may remain up to 6 months. You might need to undergo a work conditioning program before going back to work if you are involved in manual labor. You should not work if you are taking enough pain medication to affect your judgment or reaction time.

You will be allowed to get your wound wet in the shower after 1-2 days.

# Lumbar Stenosis

## Do I Need Surgery?

As we get older, our risk of spinal stenosis increases. Many people have mild to moderate degrees of stenosis and have minimal to no symptoms. Non-operative treatment of spinal stenosis consists of physical therapy, medication, and possibly cortisone [steroid] injections. As long as your symptoms are improving, surgery is not indicated. If your symptoms do not improve with non-operative treatment or your improvement has stopped at a level you cannot live with, surgery is a reasonable consideration. The available literature suggests that the natural history [what would occur without surgery] of spinal stenosis, either with or without degenerative spondylolisthesis, is characterized by improvement in approximately one third of patients and deterioration in a small minority [10%]. Most patients [approximately 50-70%] have generally unchanging symptoms with little, if any, improvement [Orthopaedic Knowledge Update, Spine 2 p.350].

## When is it Reasonable to Consider Surgery?

1. When your leg pain or weakness cannot reasonably be controlled with medications, physical therapy, and/or cortisone [steroid] injections. Only the patient knows best how much pain or weakness he or she is having and if they want to have something done about it.
2. When your symptoms last longer than 3-4 months and keep you from doing what you enjoy doing or are preventing you from working or having a good quality of life.
3. When your symptoms seem to get better but keep returning when you do your job or other things you enjoy doing and prevent you from having a good quality of life. Many people choose to have surgery because they find that the stenosis is slowly decreasing the distance they are able to walk.

## What Kind of Surgery is Done for Lumbar Stenosis?

The most common surgery done for lumbar spinal stenosis is called a lumbar decompression. In this procedure, a vertical incision is made in the skin in the midline above the spinal levels to be decompressed. The muscles are pulled to the side to allow access to the back of the spine. Part or all of the bones in the bony arch are removed to relieve the compression of the nerves in the main spinal canal. Care is then taken to remove bone spurs in the neural foramen. In some cases, the bone spurs have become so large that proper and safe removal of them requires a large amount of the facet joint to be removed. In this circumstance, a fusion of the decompressed levels is sometimes done to prevent destabilization of the spine. A fusion is a process in which two bones are healed into one bone. This is often accomplished with bone grafts and rods and screws. The bone graft is taken from a bone bank or the back part of your pelvis. Spinal stenosis surgery is mainly done for leg pain and weakness or to help bowel or bladder dysfunction. It is not usually done for back pain. In some cases, the back pain will improve with the surgery, in some cases it will not, but back pain relief is not the goal of decompression surgery.

## What Are the Results of Surgery?

Many studies have been done on the outcome of spinal stenosis surgery. They are somewhat difficult to compare to each other. A meta-analysis of 74 studies [combining the results of 74 studies for analysis] found that 72% of patients had good or excellent outcomes. This means that not all patients have a perfect result. The results of surgery tend to decrease with time. Part of why this is true is because the stenosis is usually a result of an arthritic spine and surgery will not cure all the arthritis in the spine. Some patients can have a recurrence of their stenosis if their bone spurs grow back. The results of surgery for degenerative spondylolisthesis are better than for simple spinal stenosis with good to excellent results in 80-96% of patients undergoing a decompression and instrumented fusion. [All data from Orthopaedic Knowledge Update, Spine 2 p.345-351.] Some people who have surgery will later have degeneration of the spinal level above or below the level or levels at which they had surgery. People, who have a fusion, especially if it is over several levels, are at increased risk of this. Some of these people end up needing more surgery to correct problems that develop at other levels. Non-fusion technologies may decrease these risks.

## What is the Recovery Period Like?

For lumbar decompression, patients are usually done as outpatients. If a fusion is added to the decompression, some patients will stay for 1-3 days. If you have been severely weakened by your stenosis for a long time and do not have good support at home, you might be admitted to a rehabilitation facility for a while after your stay in the hospital to improve your function before going home.

Few people require a blood transfusion for a decompression. If a fusion is added, your chance of needing a transfusion goes up a little bit. The pain from surgery is greatest for the first 1 to 3 days after surgery and slowly improves from there. Pain is usually controlled by narcotic pain medicine [pain pills]. About 50% of patients are off their pain pills within 4-6 weeks. Patients who have a fusion in addition to their decompression usually take pain medicine a little longer (6-12 weeks). Your first follow-up appointment will be 6 weeks from the time of surgery.

Restrictions after surgery consist of no lifting over 15 pounds for 6 weeks. Work status is regularly updated based upon function. You can return to work when your symptoms allow. Most people take about 2-6 weeks off work. If your job requires heavy lifting, you will need to be put on sedentary duty status with a 15 pound working restriction for 6 weeks after surgery. You might need to undergo a work-conditioning program before going back to work if you are involved in manual labor. You should not work if you are taking enough pain medication to affect your judgment or reaction time.

You will be allowed to get your wound wet in the shower after 1-2 days.

You are allowed to drive when you can move freely without the use of pain pills. You are not allowed to drive while taking pain medicine.

If you have decided to have surgery, the following questions and answers are things YOU NEED TO KNOW beforehand:

### When can I return to work?

You can return to work when your symptoms allow. If your job requires heavy lifting you will need to be put on sedentary duty status with a 15 pound lifting restriction for 6 weeks after surgery. Further restrictions are updated according to functional status. For more difficult cases or people who have a complication, it might be longer. You might need to undergo a work conditioning program before going back to work if you are involved in manual labor. You should not work if you are taking enough pain medicine to affect your judgment or reaction time.

### If you are fusing [permanently locking] bones together in my back, will I lose motion in my back?

A fusion will stop all motion between the levels being fused. If you have a very degenerated disc at the level you are going to have surgery, you have already lost some of the motion that comes from those areas. In general, patients who have a single level fusion do not tend to be able to tell a difference in motion once they have recovered from the surgery. For two levels, they might or might not be able to tell. For three levels or more, people are aware that they have lost motion. It is important to keep in mind that the majority of our ability to bend over and do things like tie our shoes and pick things off the floor come from our hips, not our back.

### What is the timeline on my limitations?

**SHOWERING:** You must keep your wound dry for 1-2 days. Brief showering can be done after that.

**DRESSINGS:** These are changed daily. Wounds are left open to air as soon as they are dry.

**HOT TUB/BATH:** You should **not** soak your wound in warm water for an extended period of time for 3-4 weeks.

**DRIVING:** You can drive if you are not wearing a brace, off of narcotic pain pills, and can turn your body without significant discomfort. These are good rules to follow, but you yourself are ultimately responsible for your own driving safety.

**EXERCISE:** Walking, stationary bike, and no bouncing aerobics can be resumed when your pain allows.

**NONCONTACT SPORTS:** Activities like golf, weight lifting, running, swimming, road biking and bouncing aerobics can be resumed in 3-6 months.

**CONTACT SPORTS:** Karate, wrestling, football, aggressive basketball, or any other aggressive sport in which you could receive a blow to your back should not be undertaken for 3 to 6 months and you should be sure you have regained your strength, balance, and coordination first.

**TANNING:** You should protect your scar from the sun for one year.

### What medicines should I **not** take BEFORE surgery?

**HERBAL MEDICINES:** These must be stopped 2 weeks before surgery. Failure to do so can result in the cancellation of your surgery.

**ASPIRIN AND ANTIINFLAMMATORY MEDICINES [ADVIL, MOTRIN, IBUPROFEN, ALEVE, AND OTHER ARTHRITIS MEDIATIONS INCLUDING PRESCRIPTION ARTHRITIS MEDICINES]:** These medicines cause blood to be “thinned” [not clot as well] leading to increased bleeding during surgery and an increased risk of suffering a bleeding complication. They should be stopped a week before surgery.

**COUMADIN [WARFARIN], AND OTHER BLOOD THINNERS OR PLATELET INHIBITORS:** You must discuss this with your surgeon so you can make a plan to be off of it long enough to be ready for surgery.

### You should take your other prescription medicines as usual.

The morning of surgery you can take them with a small sip of water, but not with anything else [no coffee, milk, soda — JUST WATER].

### What medicines should I **not** take AFTER surgery?

You should not take **Aspirin and anti-inflammatory medicines** — they decrease the ability of the bones to heal together and should not be taken for 3 months. One baby aspirin a day for your heart is OK.



### Can I go on a diet to lose weight before or after surgery?

NO. No dieting two weeks before or six weeks after surgery. Your body needs calories and good nutrition to heal well. Poor nutrition is associated with an increased infection rate.

### What do I need to know about the metal screws and rods in my back if I have a fusion?

It is made out of titanium. It is only taken out if it is causing a problem and this is rare. It should not set off alarms at the airport.

### Why am I not allowed to smoke before or after surgery?

Smoking before surgery increases your risk of certain anesthetic complications. The earlier you stop and/or the less you smoke, the better. Smoking also decreases the rate of successful fusion.

Smoking after surgery has several negative consequences that have nothing to do with the bad things you already know about it [such as heart disease and lung cancer]. It increases your risk of wound break down and infection. The nicotine in smoking is a poison to the discs in the spine and increases your risk of having problems at other levels. You will not be allowed to smoke during your stay in the hospital. I do not allow nicotine patches or other nicotine replacements because this is bad for the fusion as well.

### Do I need physical therapy after surgery?

Some people do not. This will be decided on a case-by-case basis. Walking increasing amounts every day or an exercise bike or swimming are all good forms of physical therapy. Pre-operative therapy programs can be resumed as well.

### What do I need to be able to do in order to go home?

You must be able to walk [assuming you could walk before surgery].

You must be able to urinate.

You must be able to drink liquids.

You must be able to swallow pills.

### What will my scar look like?

You will have a scar that runs up and down the middle of your back over the affected levels. If minimally invasive surgery is done, you may have several short vertical scars. If surgery is done from the front, you will have a 3-6 inch scar on your lower belly. The scar will go through phases of healing from a scab to a red puffy line to a thinner red line and eventually a small fine white line between 2-10 millimeters wide. The scar will continue to improve in appearance for two years. A small percent of people are prone to make big scars when they heal [called keloids] and are usually aware of it because they have big, puffy scars from injuries in their past.

### What sort of pain will I experience after surgery?

Patients complain of three main types of pain after surgery. The first is from their incision and muscles on their back. This is the primary pain related to the surgery and is most intense for the first 48-72 hours and slowly improves after that. The second type of pain is a sore throat from the breathing tube and pain with swallowing. This typically improves in 2-4 days. Most people are able to swallow their pills a few hours after surgery even though they have some discomfort. The third complaint is pain down the legs from the nerves being irritated from the surgery. This usually resolves over several weeks. If the nerves have been pinched for a long time, it can take a while (months) for them to recover. Not all nerves will have a full recovery although the goal of the surgery is to give the nerves the best environment possible for healing.

During the first 6-8 weeks of recovery, occasionally patients will mention other more random types of pain such as pain in the opposite leg or a new pain that started in the back or leg in a different place. The majority of these pains go away on their own as the back heals and should not be concerns unless they persist for more than 6 weeks.

During your recovery you will have good and bad days but should see an overall improvement on a week-by-week basis.

### What do I need to know about pain medicines?

The pain pills used after surgery are usually a combination pill containing Tylenol and a narcotic. There are many different types and they come in different strengths. The number of pills you can take is limited by the amount of Tylenol (acetaminophen) in them, and should not take more than 4000 mg (equal to 8 extra strength Tylenol pills) of Tylenol per day. They are usually taken every 4-6 hours.

The most common side effects of pain pills are drowsiness, feeling “funny”, nausea and constipation. EVERYONE will get some degree of constipation from pain pills and many people require stool softener and/or a laxative while taking them. These can be purchased at the drug store without a prescription and you should not feel bad about using them. You will feel bad in 4-5 days after surgery if you don't have a bowel movement. This is not an emergency; you just need to take these medicines to control your constipation.

Many people get nauseated with pain medicine. Nausea to pain pills is a side effect, not an allergy. You should inform your doctor of past problems with pain pills. Young people are more likely to get nauseated than older people. Here are some tips to avoid nausea with pain medicines if you are having trouble:

1. Don't take your medicine on an empty stomach.
2. Nausea can be dose related. One pain pill might be OK for you when two at a time is not.
3. Motion increases nausea. If you are having trouble, try to lie down for the hour after you take your pill.
4. You will need more pain medicine for the first few days after surgery than you will later so just take it easy for the first few days.
5. Some people find that they are able to switch to regular Tylenol a few days after surgery and often only take a pain pill at night.
6. If the above tips do not work for you, you should call your doctor.

You should not drive while under the influence of pain pills, just as you should not drive when you are drinking.

Pain pills work best when you stay ahead of the pain. For the first few days after surgery, I recommend setting your alarm for the middle of the night to take some pain medicine so that you will still have some in your system when you wake up in the morning. Also, use a piece of paper to chart when you take your medicines so that you can keep track of what and when you are taking things.

REFILLS ON PAIN PILLS ARE ONLY DONE DURING OFFICE HOURS. Pay attention to when you will run out of pills. If you need more, you must request them 48 hours in advance so that the office can properly process your request [don't wait to call until Friday if you are going to run out on Sunday, make the call on Thursday at the latest]. Some pain pills cannot be called into the pharmacy and a prescription must be picked up from the office.

#### What if I have trouble sleeping after surgery?

It is OK to take Benadryl 25 or 50 milligrams before you go to bed to help you rest. This can be purchased without a prescription.

#### Will I get antibiotics for surgery?

Everyone gets antibiotics at the time surgery. The rate of infections on the front of the spine is very low.

#### What do I need to do before surgery?

1. Review when you need to be at the hospital.
2. Remember no eating or drinking after midnight before surgery.
3. If you have kept any x-rays or MRI or CT scans, bring them with you.
4. Take your regular medicines as described above.
5. Bring a list of your regular medicines and their dosages with you.
6. Be sure you have lined up someone to take you home from the hospital. You will want to have someone available to you for the first day or two you are home to help out.
7. Have simple foods lined up to eat in case you get nauseated. Saltines, 7-UP, and chicken soup are popular.
8. Buy some gauze and tape for dressing changes after surgery as well as a thermometer.
9. Make sure all your questions have been answered.

#### What does a wound infection look like?

Wound infections usually occur 7-14 days after surgery. A small amount of drainage for 3-5 days after surgery is OK.

Just change your dressings every 8-12 hours until they stay dry. Do not put **anything** like Betadine, hydrogen peroxide, or Neosporin on your wound, just dry dressings. If your drainage is increasing over a day or two and soaking your bandages you should call your doctor. It is normal to have a small amount of redness around the wound. If the redness is increasing, if the skin is becoming more tender to touch, or if white pus is coming out of the wound, you should call your doctor. Most people have a low grade temperature [99-101.4 degrees] after surgery. This is your body's normal reaction to the surgery. If you are having chills and sweats and/or temperature over 101.5, you should call your doctor. Feeling the patient's forehead is not an accurate way to check a temperature.

### Am I breakable?

The combination of metal rods and screws as well as the bone graft makes a strong construct. Many people feel "breakable" after surgery and are afraid to resume their normal activities for fear of hurting their neck. As long as you follow the post-operative instructions, you should have no problems. If you have poor bone quality and/or a fusion over many levels, the doctor might have you wear a brace for a while to protect your back. If the doctor has any concerns about the stability of the back, he will put you in a brace.

### Why is my skin yellow around the wound?

This is left over cleaning solution from surgery. It will wear off with time.

### Other pain control techniques

Cold pack/heating pads: A cold pack on the wound for the first two weeks is OK if it helps your pain. After two weeks, you can use a hot or cold pack if your wound is healing well and if it makes your pain better. Avoid falling asleep on a heating pad because of the risk of getting burned.

In general, the sooner you get up and about and back to your regular activities the better you will feel. Lying around all day in bed will make you feel worse. Place yourself and slowly increase your activities every day. Start with short walks and activities and slowly increase the distance you walk and the time you are up every day. Doing this might make you sore but it will not damage your back and it is an important part of your recovery.

### When should I call the doctor?

If you have increasing weakness or numbness, a loss of control of your bowel or bladder, uncontrollable nausea that is not helped by the above instructions, or symptoms of a wound infection as described above, you should call your doctor. Never hesitate to call with questions.