

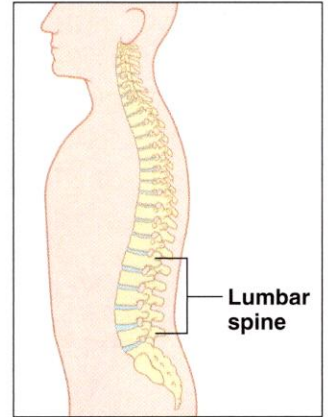


ATLANTA  
SPINE  
INSTITUTE

**PLLIF**  
**INFO**

# Learning About Low Back Problems

**Vertebrae** are bones that stack like building blocks to make up your spine. The **lumbar spine** contains the five bottom vertebrae in your back. When the lumbar spine is healthy, you can bend and move in comfort. But if part of the lumbar spine is damaged, pain can result.

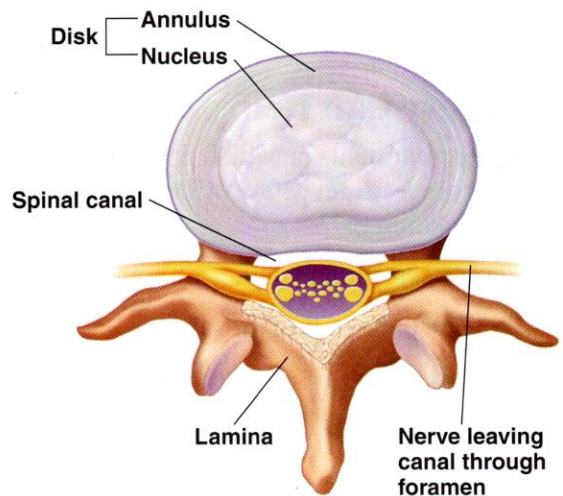


## A Healthy Lumbar Spine

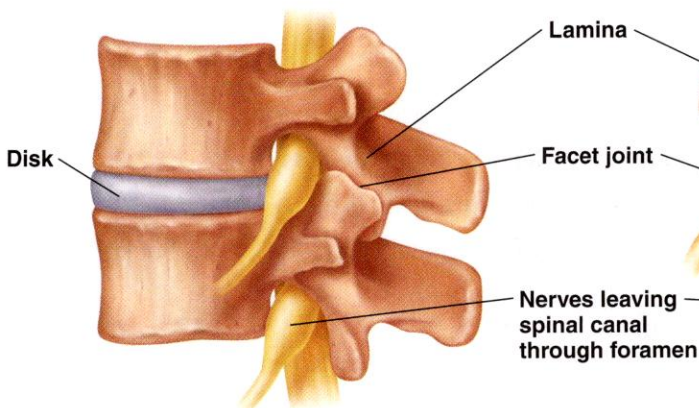
In a healthy lumbar spine, all the parts work together.

- **Disks** are soft pads of tissue that act as shock absorbers between the vertebrae. The firm, fibrous outer layer of a disk is called the **annulus**. The soft center of the disk is called the **nucleus**.
- The **spinal canal** is a tunnel formed within the stacked vertebrae. The opening between the vertebrae on either side of the spinal canal is called the **foramen**.
- **Nerves** run through the spinal canal. They branch out from the spinal canal through the foramen on each side.
- The **lamina** is the arched part of each vertebra that forms the back of the spinal canal. **Facet joints** are the joints where the vertebrae meet.

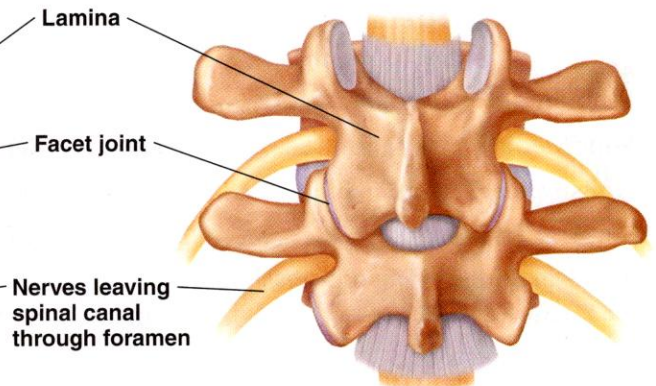
Top view of a vertebra



Side view of two vertebrae



Back view of two vertebrae



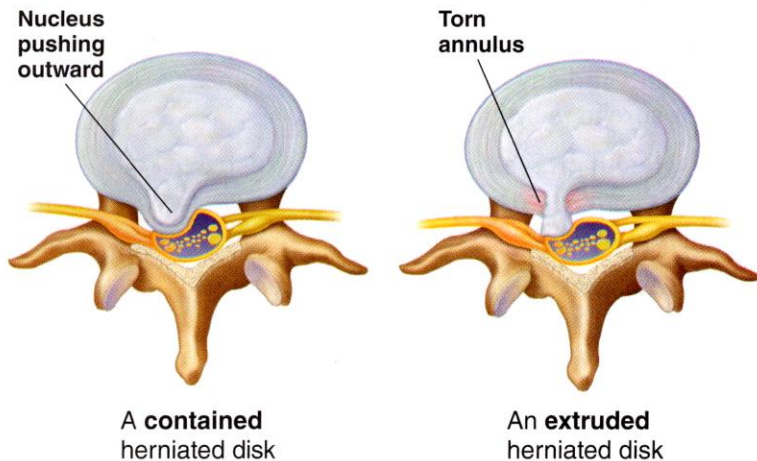
## A Painful Lumbar Spine

Low back pain can be caused by problems with any part of the lumbar spine. A disk can **herniate** (push out) and press on a nerve. Vertebrae can rub against each other or slip out of place. This can irritate facet joints and nerves. It can also lead to **stenosis**, a narrowing of the spinal canal or foramen.

### Pressure from a Disk

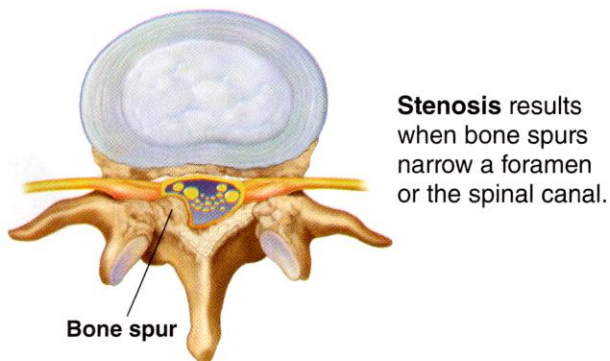
Constant wear and tear on a disk can cause it to weaken and push outward. Part of the disk may then press on nearby nerves. There are two common types of herniated disks:

- **Contained** means the soft nucleus is protruding outward.
- **Extruded** means the firm annulus has torn, letting the soft center squeeze through.



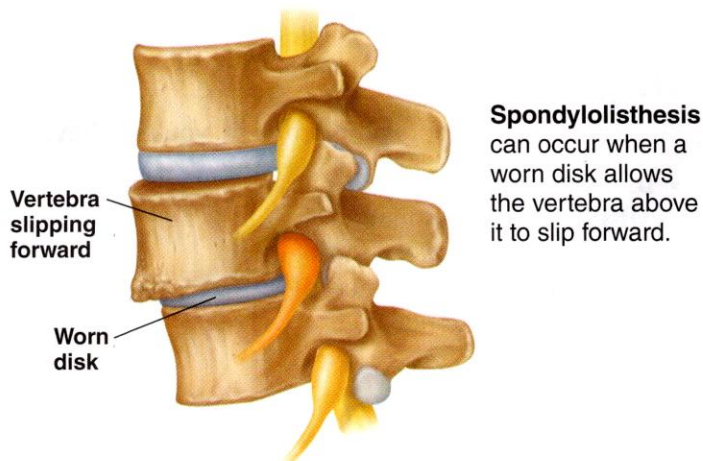
### Pressure from Bone

With age, a disk may thin and wear out. Vertebrae above and below the disk may then begin to touch. This can put pressure on nerves. It can also cause **bone spurs** (growths) to form where the bones rub together. Stenosis results when bone spurs narrow the foramen or spinal canal. This also puts pressure on nerves.



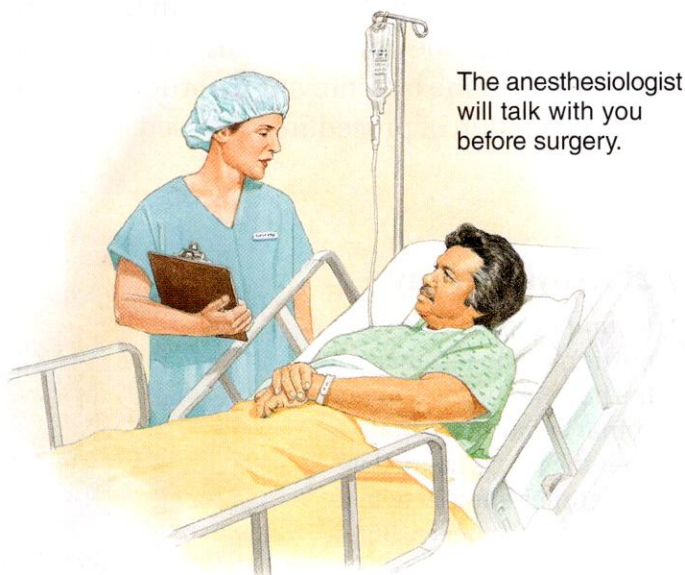
### An Unstable Spine

In some cases, vertebrae become unstable and slip forward. This is called **spondylolisthesis**. Slipping vertebrae can irritate nerves and joints. They can also worsen stenosis.



## The Day of Surgery

Arrive at the hospital on time. Before surgery, your blood pressure and temperature will be taken. You'll be given an intravenous line (IV) to provide fluids. You may also get medication to help you relax. Just before surgery you'll be given **anesthesia** (medication to prevent pain). Local or regional anesthesia numbs just the surgical area. General anesthesia lets you "sleep" during the operation.



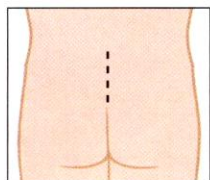
The anesthesiologist will talk with you before surgery.

## Reaching Your Spine

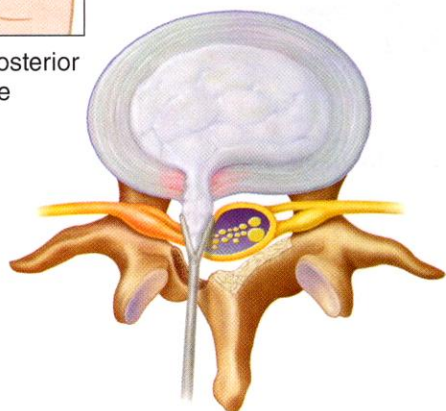
To operate on your spine, the surgeon will make an incision through your skin. The incision will be in your back (**posterior approach**), or in your abdomen (**anterior approach**). After surgery, the incision is closed with stitches or staples.

### Posterior Approach

Your surgeon reaches the spine through your back. In some cases, a microscope is used to view damaged areas more clearly.



Possible posterior incision site

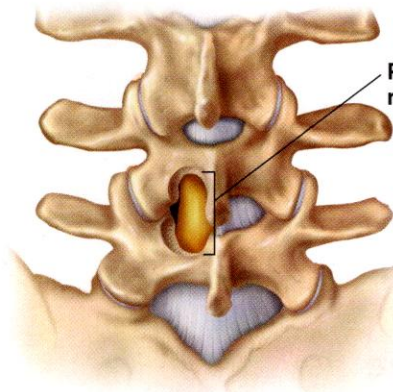


# Types of Surgery: Decompression

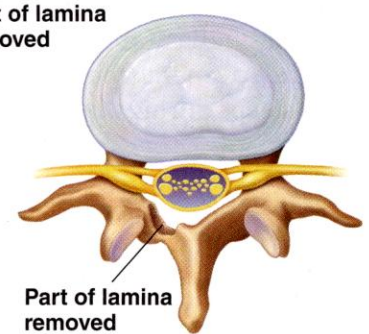
Decompression is a type of surgery that takes pressure off a nerve. This can be done by removing bone from vertebrae. It can also be done by removing a portion of a disk. Sometimes, a combination of procedures are used.

## □ Laminotomy

A laminotomy removes a portion of the lamina—the bone at the back of the spinal canal. The small opening that is created is sometimes enough to take pressure off a nerve. But in most cases, part of a disk or a bone spur that is pressing on a nerve is also removed.



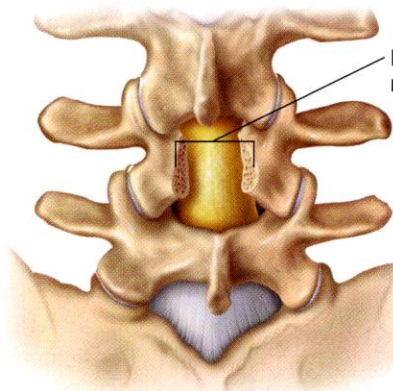
View from the back



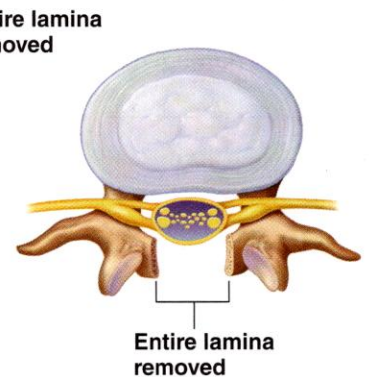
View from above

## □ Laminectomy

A laminectomy removes the entire lamina. This helps relieve pressure when a disk bulges into a nerve. If needed, your surgeon can also remove any part of a disk or bone spur that presses on a nerve. He or she may also enlarge the foramen to ease pain caused by stenosis. After the procedure, the new opening in the spine is protected by the thick back muscles.



View from the back



View from above

# Types of Surgery: Fusion

Spinal fusion is a type of surgery used to make the spine more stable. It can also help ease lower back and leg pain. During the surgery, two or more vertebrae are locked together (**fused**) using a bone graft. This keeps the bones from shifting and pressing on nerves.

## ❑ The Fusion Procedure

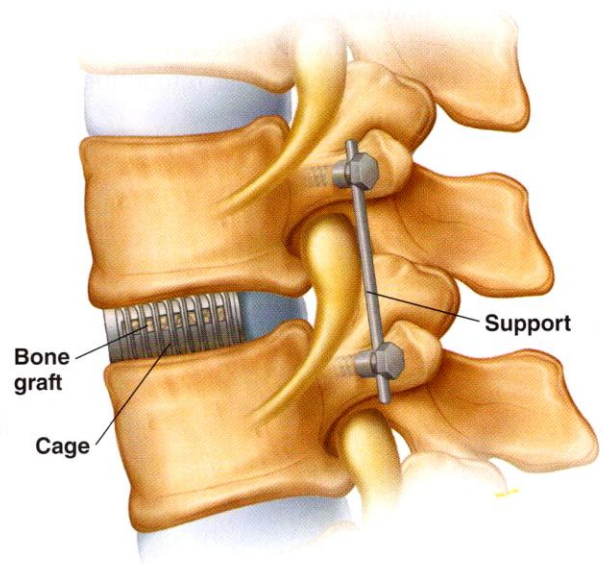
Fusion surgery can be done using one of several methods. Ask your doctor about the steps of your procedure.

- Part of a disk may be removed from between the vertebrae to be fused.
- Bone graft (see below) is packed between the vertebrae. In time, the graft and nearby bone grow into a solid unit.
- To keep the spine steady as it fuses, support may be used. A metal plate may be put over the vertebrae and graft and secured with screws. Or a cage (plastic or metal “basket” packed with bone graft) may be put into the space where the disk was removed. These supports stay in place permanently.

## Understanding Bone Graft

Bone grafts are very small pieces of material used to “cement” vertebrae together. Grafts can come from your own body, a bone bank, or artificial sources. In some cases, bone protein (**BMP**) may be used. Your surgeon will discuss these options with you.

View from the side



During fusion surgery, bone graft is packed between two or more vertebrae.

## Risks and Complications of Fusion

Risks and possible complications of spinal fusion surgery include:

- Infection
- Bleeding or blood clots
- Nerve damage
- Bones not fusing, or bone graft shifting out of place
- No improvement in pain, or worsened pain
- Need for second surgery
- Spinal fluid leakage
- Paralysis (very rare)

# Posterior Lumbar Fusion

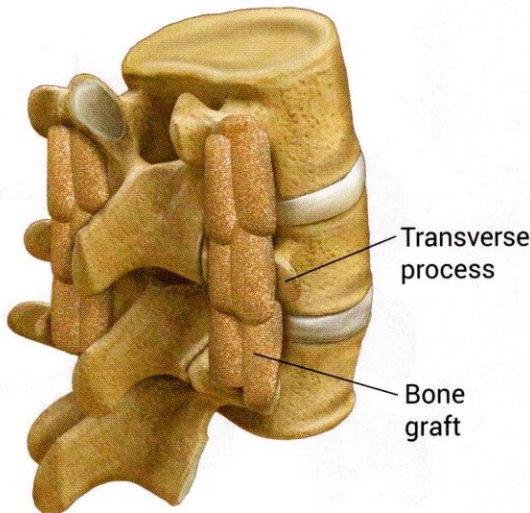
*Posterior lumbar fusion* may help ease low back and leg pain. For this, 2 or more vertebrae in the low back are fused. This is done through an incision in your low back (posterior). The graft may be put between the transverse processes, in the disk space, or both.



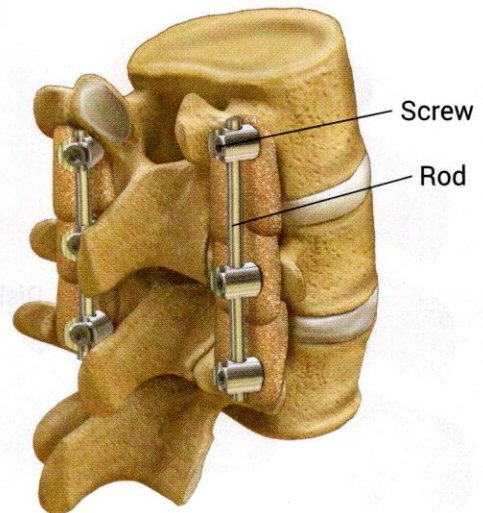
Lumbar vertebrae

## Fusing the Transverse Processes

- An incision is made in your back to reach the spine.
- Bone graft is packed between the transverse processes (wings of bone) on the sides of the vertebrae. Nearby parts of the vertebrae may also be fused.
- For extra support, screws and rods made of surgical metal may be placed. The supports stay in the body and are not removed.
- The incision is closed with sutures, staples, or surgical glue.



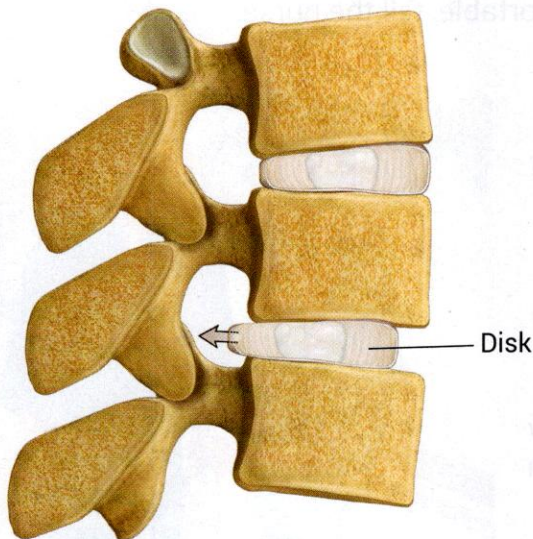
Bone graft is placed between the wings of bone on the sides of the vertebrae.



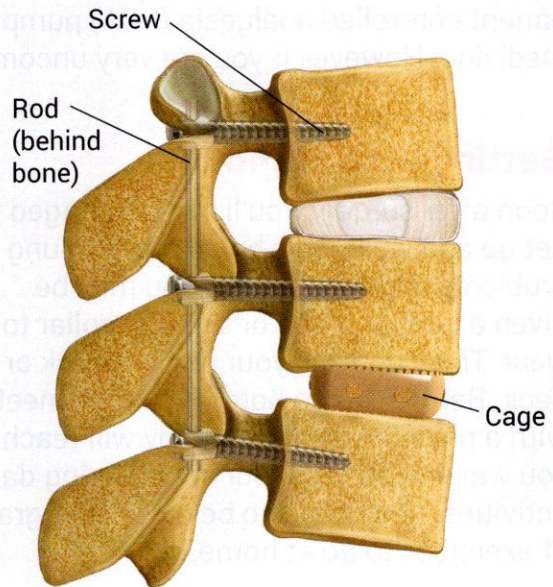
Metal screws and rods may be placed to give extra support.

## Fusing the Disk Space

- An incision is made in your back to reach the spine.
- Most of the disk between the vertebrae is removed.
- Bone graft is placed. It is usually put inside a device called a cage. The cage full of bone graft is placed in the space between the vertebrae.
- Metal screws and rods may be placed on the back of the vertebrae to give extra support.
- The incision is then closed with sutures, staples, or surgical glue.



The disk is removed from between the vertebrae.



Bone graft inside a cage may be placed. Metal screws and rods may be used to give extra support.



A T L A N T A  
I N S T I T U T E

PLAS T. JAMES, M.D.

DIPLOMATE OF THE AMERICAN BOARD OF ORTHOPAEDIC SURGEONS

## LUMBAR FUSION

Your doctors have determined that you have an abnormality in your back that may be best treated by an operation and have offered you surgical treatment. A lumbar "fusion" is an operation on the spine in the lower part of your back where the doctors put "bone graft" between two or more vertebrae to make them heal as one. This operation may or may not be done in combination with a lumbar laminectomy or Diskectomy. The most common problems making this surgery necessary are "spondylolisthesis", clinical "instability", "failed disc surgery", or other forward on another vertebrae, causing back pain or leg pain or both, or deformity. Clinical instability is when there is too much motion between two vertebrae due to loss of some of the supporting structures, such as the ligaments and disc, which may cause pain in the back or legs or both. Sometime when patients have intractable back pain after having a disc removed, they may be helped by a fusion as well.

The technique of lumbar fusion can be done many different ways. The "bone graft" is often taken from the patient's iliac crest (hip bone). It can also be taken from a "bone bank" and obviate the need of taking bone from one's hip. Also, if a laminectomy is done concomitantly with the fusion, this "local" bone can be used in performing the fusion. This bone graft serves to stimulate bone formation and healing similar to the way a fracture heals. It takes from six months to a year for a fusion to become fully solid. The longer the attempted fusion, the less likely the fusion is to heal. One and two level fusions heal about 80% of the time. It may be recommended that you be placed in a brace for about six weeks postoperatively. This is to allow some soft tissue ingrowth to the fused area. Some patients with fusion may require metal hardware / internal fixation of their fused vertebrae. Internal fixation can be done with a combination of rods, hooks, wires, plates, and /or screws. This is a decision that your doctors must make, given your unique situation. It is important that you follow the postoperatively instructions carefully to allow for good strong healing of the fusion and your general rehabilitation from surgery.

### COMPLICATIONS AND RESULTS:

Complications from this type of surgery may occur. It is possible that you will be no better after having had this surgery. It is even possible that you may be worst after the operation than you are right now. Because of these facts, your doctors can make no guarantee as to the results that might be obtained from this operation. Generally speaking, however, our results have been good or excellent in over 75% of the patients undergoing this type of surgery.

1 of 3

As in any operation, this type of surgery can be complicated by excessive bleeding and infection (1%). These complications can result in the need for blood transfusion, the need for further surgery, prolonged illness, increased medical cost, increased pain, suffering and disability, and even death (very rare). Injuries to the spinal cord and nerves of the back are uncommon with this kind of surgery, but can occur. This type of complication can result in temporary or permanent weakness of one or more of the muscles in one or both legs. Also, pain and numbness in the lower half of the body on one or both sides can result, as well as loss of bladder and bowel control and sexual dysfunction (very rare). The fusion may fail to heal, resulting in a diagnosis of "pseudoarthrosis". Some pseudoarthrosis are not painful and, therefore, the results of the surgery can be successful. However, some patients with pseudoarthrosis continue to experience pain, and this may irritate structures in the back. Loss of some motion in the back is inevitable after a fusion, as this is the goal of the operation. Hopefully, the tradeoff of decreased pain is worth the loss of some motion. Usually, the segments adjacent to the fusion are able to make up for some of the lost motion. However, because of the increased stresses at the adjacent segments, sometimes patients develop degenerative (wear and tear) changes and necessitate surgery ten or twenty years later.

When metal hardware is used there is a possibility of metal failure or loosening (rare). On rare occasions, hardware may have to be removed.

Some patients have continued back problems after this type of surgery. Occasionally the same problem which made the surgery necessary in the first place can come back at an adjacent level. In the case of a ruptured disc, the likelihood for re-rupture is probably about 2-3%.

Other complications are possible including spinal fluid leakage which may take a long time to subside or even necessitate the need for further treatment or surgery. It is possible that the disc space may collapse or that the spine may become unstable or may degenerate further with age resulting in a recurrence of back and/or leg pain or a worsening of these conditions if there was little relief of them immediately following surgery. This may require the need for additional surgery in the future (approximately 5-10%).

Other possible problems are impaired function due to limp, foot drop, continued pain or discomfort, increased or different pain, bone infection, numbness or clumsiness in the leg(s), impaired muscle function, and again, recurrence or continuation of the condition for which the operation was performed.

It is important to note that certain complications can result in increased costs and time to recover (if ever) with prolonged time off work and resultant economic hardships and possible emotional, marital, or psychological problems.

**ALTERNATIVES AND OTHER CONSIDERATIONS:**

There may be alternatives to this operation available to you such as the use of medications and traction and other techniques. Medications have been developed that can be injected into the disc space to help dissolve the jelly. Equipment is available to aspirate (suck out) disc material; however, the results with these techniques are not as good as the surgery which is being offered to you. These alternative therapies also carry their own risks in those patients in whom lumbar laminectomy or Diskectomy surgery is indicated, we feel this operation provides the patient with the best chance of successful treatment and a low risk of complications.

It is important that you stop taking any aspirin, aspirin-containing drugs and other aspirin-like (anti-inflammatory) medicine at least 10 days or so prior to surgery. These medications cause increased bleeding at the time of surgery which we would like to avoid. Please call or ask us if you need help with this.

**SUMMARY AND ACKNOWLEDGMENT**

The scope of this informational handout may not be complete. Patients have the right to have their questions answered to their satisfaction and in a manner they understand. We want you to understand the risks and alternatives available. It is our purpose to provide you with the best medical care possible. We need for you to be well informed regarding your treatment, tests and any surgery that you may undergo. If you have any questions or concerns that are not answered, please ask for further information so that you can be more comfortable with what is being done for you. After reading this material carefully, please do not hesitate to call us back for any additional questions you may have (404)352-4500.

I have read this document under quiet conditions at my leisure away from Dr. James' office and have discussed it with those family members I feel should be aware of its contents. I understand its contents and accept the inherent risks in such major surgery.

\_\_\_\_\_  
Witness

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name

\_\_\_\_\_  
Date



NORTH AMERICAN SPINE SOCIETY  
6300 North River Road, Suite 727  
Rosemont, Illinois 60018-4226 U.S.A.  
(708) 698-1630 FAX (708) 823-0536

## POSITION STATEMENT Pedicle Screw Fixation Devices

Treating a painful, deformed, or unstable spine may require fusion surgery to hold a portion of the spine permanently in a desirable position. A bone fusion must mature for several months before it is secure. During that time the best position may be held by a device that is affixed to vertebrae and implanted within the body. While not all spine fusions require implants, many patients whose spines are weakened by injury or disease or whose deformities must be corrected are treated best if the operation includes internal fixation.

Surgeons have positioned and held the spine with many different internal devices, most often metal rods or plates that span two or more vertebrae. Such devices must be fixed to the vertebrae in ways that are strong, safe, and as much as possible, harmless to adjacent normal vertebrae.

For many years, wires and hooks were used to affix rods or plates to the spine. In the 1960's, Canadian, American, and French surgeons independently developed techniques to insert bone screws through the sturdy side pillars of the vertebrae, the pedicles. When operating from the back of the spine, the safest access to the vertebral bodies is through the pedicles. The stable hold on a vertebra achieved by screw fixation permits greater correction of deformity and more rigid fixation, and often spares adjacent healthy vertebrae that would have been included in the fusion were less stable wires or hooks used.

Spine fusions are performed for many disorders. A great variety of technical challenges exist. Passing a bone screw into a vertebra through its pedicle is only one small step common to many complex procedures. Placing a screw into a pedicle, therefore, does not, in itself, define an operation, nor is it an act that a sophisticated judge of surgical care would be generally "for" or "against".

As with all operations, errors can occur in application and in selecting patients for new techniques. Seeking to eliminate such errors, leaders of the spine care community have sponsored research and given many training courses and seminars so that those already specialized in spine surgery may learn to properly and safely use screws for fixation to the spine. A large number of peer-reviewed articles describe laboratory and clinical research that documents the efficacy and safety of spinal screw fixation. Extensive testing, worldwide use, more than two decades of experience, and availability of training to all qualified surgeons mean that inserting screws into the vertebral pedicles of properly selected patients by qualified surgeons is within the standards of good practice and is not experimental.

POSITION STATEMENT  
Pedicle Screw Fixation Devices  
Page 2 of 2

The North American Spine Society supports the Food and Drug Administration's mission to ensure the safety and efficacy of those products it approves for marketing in the United States. We welcome efforts now underway by FDA representatives, major spine societies, and spinal implant manufacturers to clarify standards for bone screws used in the spine. We also appreciate the FDA's effort to not interfere with physicians' abilities to practice in the best interests of their patients.

For many patients, the best treatment requires using bone screws fixed to their vertebrae through the pedicles. Since the skills and technology are available, treating those patients otherwise would be suboptimal for many and simply wrong for some. The surgeon's obligation is to provide the best treatment available.

Critical analysis of how and for whom internal fixation of the spine is best used must continue. Meanwhile, those patients for whom spinal fixation with screws inserted through the pedicles is the best treatment should have the opportunity to receive that treatment.

Board of Directors  
North American Spine Society

October 1993

Received by \_\_\_\_\_  
Patient

Witness \_\_\_\_\_

Date \_\_\_\_\_



**PLAS T. JAMES, M.D.**

DIPLOMATE OF THE AMERICAN BOARD OF ORTHOPAEDIC SURGEONS

## **LUMBAR POSTOPERATIVE PROTOCOL**

1. Do not smoke or chew tobacco products, which could greatly decrease your chance of a successful surgery and/or fusion.
2. No bending, lifting, or twisting. (No lifting greater than 10 pounds, i.e., gallon of milk) for the first 6 weeks post-operatively.
3. You may sit as often as you like but not longer than 30 minutes at a time in an upright 90-degree chair. Take 10-minute breaks to stand, walk, or lie down. (Please find a chair with lumbar support/armrest and not very low to the ground).
4. Normal household walking. Limit stairs.
5. Exercise: Walk ten (10) minutes a day for first week. Twenty (20) minutes a day for the second week. Thirty (30) minutes a day for the third week. This should be on level ground, i.e., track, mall walking. (THIS IS IN ADDITION TO HOUSEHOLD WALKING).
6. Wear brace when walking any longer other than going to the restroom and returning. However, you do NOT have to wear brace when sitting on a chair with a back support.
7. **DO NOT BECOME CONSTIPATED!!** Use stool softeners, prune juice, etc. If no bowel movement after being home for 24 hours, use a laxative of choice (one bottle of magnesium citrate or Milk of Magnesia. Use Colace 100 mg by mouth twice a day). Can also supplement with Miralax and Citrucel. Drink plenty of water.

**Saint Joseph's Doctors Center**

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### **LUMBAR POSTOPERATIVE PROTOCOL (continued)**

8. Patient may shower over dressings only if they have on Aquacel dressing or a clear plastic-water resistant dressing (i.e., op-site dressing).
9. No soaking - Coordinate showers with Home Health visits if possible.
10. Aquacel dressing should remain on until first postop visit. The Aquacel dressing can be worn without issue in the shower. If the bandage becomes saturated or comes off, please contact the office for further instruction.
11. Wear compression stockings until re-check in office.
12. **MEDICATIONS**: Continue all antibiotics until all have been taken per the Pharmacy. For the first three (3) months, do not take anti-inflammatory medication such as Ibuprofen, Advil, Aleve, Celebrex, Aspirin, Voltaren, and Zipsor (diclofenac), as it decreases bone growth (SEE LIST).  
  
\*Post-op medication, i.e., narcotics, cannot be phoned into the pharmacy. The prescription **MUST** be picked up in person or mailed.
13. No flying or driving until re-check in the office. Patient may drive without back brace if the car has a lumbar support. Please wear a seatbelt including shoulder harness and lap belt.
14. Limit time in the car to 30-45 minutes if possible and break trip up if necessary.
15. You can apply ice/cold pack to the surgical site for 20 minutes at a time. **NO HEAT!**



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**LUMBAR POSTOPERATIVE PROTOCOL (continued)**

16. Call the Doctor if temperature rises greater than 101.5 degrees F or chills.
17. Notify the Doctor if wound(s) develops purulence (pus), excessive redness, clear drainage, foul odor, or severe postsurgical headaches.
18. CALL FOR FOLLOW-UP APPOINTMENT IMMEDIATELY AFTER DISCHARGE FROM HOSPITAL TO BE SCHEDULED APPROXIMATELY 14 DAYS POSTOP.





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**\*\*\*MEDICATIONS TO AVOID 7 DAYS PRIOR TO SURGERY\*\*\***

**DO NOT TAKE: CBD PRODUCTS, VITAMIN E, ASPIRIN, OR WEIGHT LOSS PRODUCTS, AS THESE MAY PROLONG BLEEDING TIME.**

**If you are on COUMADIN, please notify us IMMEDIATELY. You must contact the physician who prescribed this medication. He/She will need to make the decision if you are able to discontinue this medication for surgery. They will then provide our office with written medical clearance.**

**HERBS TO AVOID:**

ECHINACBA	ST. JOHN'S WORT	GINKGO BILOBA
MELATONIN	GRAPE SEED OIL	GARLIC TABLETS
FISH OIL	TUMERIC	GINGER
CAYENNE PEPPER	CASSIA CINNAMON	DONG QUAI
GRAPE LEAF EXTRACT	FEVER FEW	BROMELAIN

**ASPIRIN PRODUCTS TO AVOID:**

ALKA SELTZER	ANACIN	ASCRIPITIN	BC TABLETS
BUFFERIN	CHERACOL	COPE	CORICIDIN
DARVON COMPOUND	BAYER	FIORINAL	DRISTAN
SOMA <u>COMPOUND</u>	ECOTRIN	EMPIRIN	EXCEDRIN
GOODY'S POWDER	SINE-AID	SINE-OFF	PERCODAN
STENDIN	VANQUISH	TRIAMINICIN	MIDOL

**IBUPROFEN PRODUCTS TO AVOID:**

ADVIL      MEDIPREN      NUPRIN      ALEVE      RUFFEN      MOTRIN

**ANTI-ARTHRITIC PRODUCTS TO AVOID:**

VOLTAREN (Diclofenac)	CLINORIL	FELDENE	INDOCIN
NAPROSYN	TOLECTIN	ANAPROX	ORUDIS
DOLOBID	RELAFEN	ANSAID	DAYPRO
BUAZOLIDIN	ORUVAIL	DISCALID	SALFLEX
MONO-GESIC	LODINE (Etodolac)	CATAFLAM	TORODOL
NAPRELAN	CELEBREX	DICLOFENAC	ZIPSOR
MOBIC (Meloxicam)	ARTHROTEC	CHONDROITIN	GLUCOSAMINE

**If you have any questions or concerns about these or any other medications you are presently taking, please call 404-252-2422.**



ATLANTA  
**SPINE**  
INSTITUTE

**PLAS T. JAMES, M.D.**

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ORTHOPAEDIC SURGERY  
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