

Preparing for Lumbar Spinal Fusion advanced level

Overview

Spinal fusion is a surgical procedure performed to permanently join together one or more bony vertebrae of the spine. Fusing bones together can prevent painful motion and provide stability. An unstable spine can result from an injury, disease, or the natural aging process. When these changes allow abnormal movement of the vertebrae to rub against one another, back, leg, or arm pain may result. Fusing the vertebrae stabilizes and aligns the spine, maintains the normal disc space between the vertebrae, and prevents further damage to your spinal nerves and cord.

Spinal fusion should be performed only for the right reasons and if all other treatments have been explored. It will not “fix” your back problem or provide complete pain relief. It will stop the motion in the painful area of your spine allowing you to increase your function and return to a more normal lifestyle—though one that may not be totally pain-free. Because back pain responds well to physical therapy and exercise, make sure you have done your part toward a successful rehabilitation before considering surgery.

What you do before and after surgery can help get you back on your feet sooner. It’s important to have realistic expectations and prepare properly for your recovery.

What is spinal fusion?

At each level of the spine, there is a disc space in the front and paired facet joints in the back. Working together, these structures define a motion segment (Fig. 1A). Back pain may result when injury or degenerative changes allow abnormal movement of the vertebrae to rub against one another, known as an unstable motion segment (Fig. 1B). Two vertebrae need to be fused to stop the motion at one segment. For example, an L4-L5 fusion is a one-level spinal fusion (Fig. 1C). A two-level fusion joins three vertebrae together and so on (see [Spinal Fusion: an introduction](#)).

Bones can be fused together by (1) using your body’s natural healing process, (2) using bone from another place in your body (autograft), (3) using bone from a bone bank (allograft), or (4) with the aid of metal devices. For fusion to occur

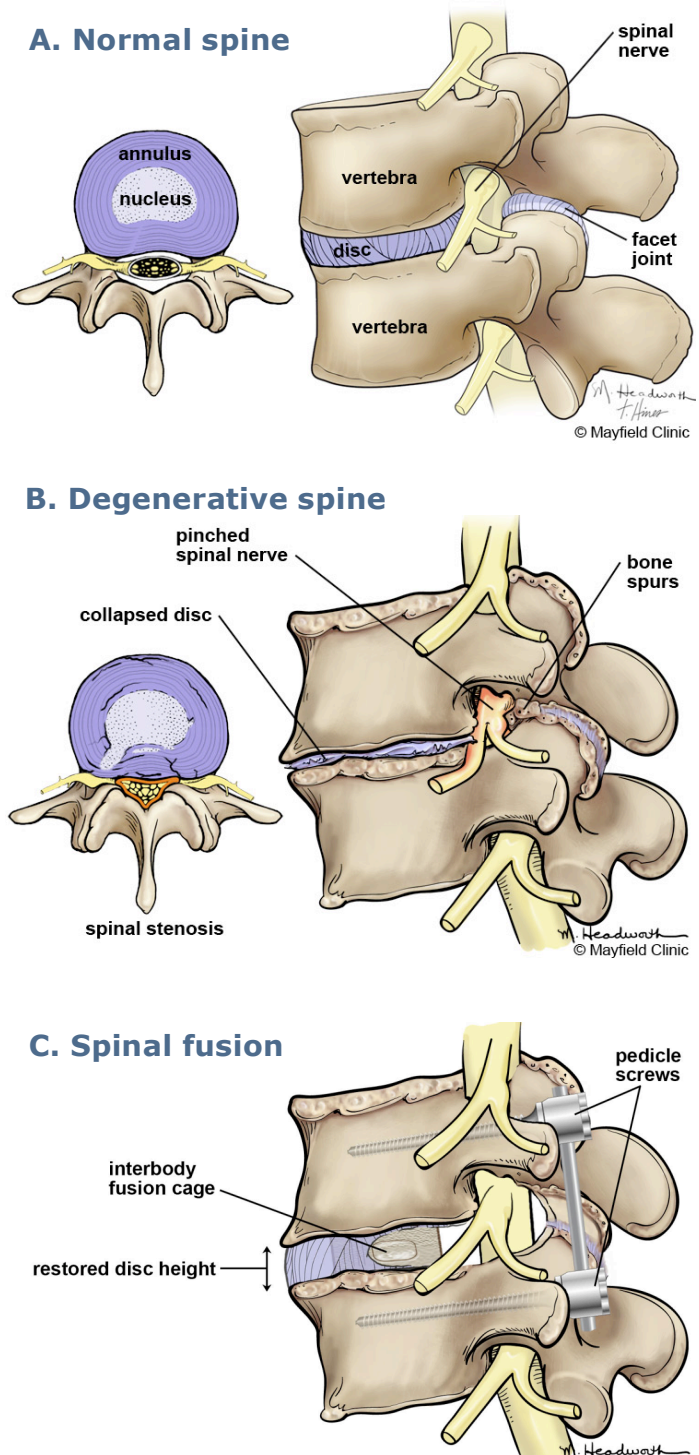


Figure 1. A. Normal spine. B. Degenerative spine disease impairs the disc and facet joints causing spinal instability and back pain. C. Spinal fusion restores the normal height of the disc space and prevents abnormal movement.

between two vertebrae, a bone graft is needed to serve as a bridge. The bone graft must be placed in a "bed" where the area has been prepared by removing the outer cortical bone to expose the blood-rich cancellous bone inside. And lastly, the bone graft and vertebrae must be immobilized while the bone graft and bed heals and fuses. The fusion area is often immobilized and held together with metal plates, rods, hooks, screws, or cages. After surgery the body begins its natural healing process and new bone is formed. After 3 to 6 months, the bone graft should join the vertebrae above and below to form one solid piece of bone. With spinal instrumentation and fusion working together, new bone will grow around the metal implants – similar to reinforced concrete.

What happens before surgery?

Health exam

You will need a complete physical exam to be sure you are in good health. See a health care provider 3 to 30 days before surgery for a history and physical (H&P) exam. A blood test, electrocardiogram (EKG), and chest X-ray need to be performed. Discuss all medications (prescription, over-the-counter, and herbal supplements) you are taking with your health care provider. Some medications need to be continued or stopped the day of surgery. Medications that thin the blood should be stopped 2 weeks prior to surgery. Drugs that thin the blood include:

- Aspirin
- Ibuprofen (Advil, Motrin, Nuprin)
- Anti-inflammatories (Aleve, Naprosyn)
- Fish oil
- Vitamin E
- Herbals (gingko, glucosamine)
- Blood thinners (Coumadin, Heparin)
- Antiplatelets (Plavix, Ticlid, Fragmin, Orgaran, Lovenox, Innohep)
- Wintergreen snuff

Also, stop drinking alcohol 1 week before and 2 weeks after surgery because these activities can cause bleeding problems.

The hospital will call you 1 to 2 days before your surgery and ask questions about your health (allergies, bleeding history, anesthesia reactions, previous surgeries). They will also ask for a complete list of medications including prescriptions, over-the-counter, and herbal supplements.

Smoking

The most important thing you can do to ensure the success of your spinal surgery is quit smoking. This includes cigarettes, cigars, pipes, chewing tobacco, and smokeless tobacco (snuff, dip). Nicotine prevents bone growth and puts you at higher risk for a failed fusion. Patients who smoked had failed fusions in up to 40% of cases, compared to only 8% among non-smokers [1]. Smoking also decreases your blood circulation, resulting in slower wound healing and an increased risk of infection.

There are many ways to help you quit smoking:

- Over the counter and prescription nicotine replacements (for use only before surgery)
- Pills without nicotine (Wellbutrin, Chantix)
- Tobacco counseling programs

Home preparation

It's a good idea to get your home ready before surgery. Move things that you use often to a level between your shoulders and hips, so you do not have to bend or reach. Tie up phone cords and pick up throw rugs so you don't trip. Prepare and freeze meals. Put non-slip strips in the shower/tub. You may need grab bars in the tub or toilet area. Get a chair with a firm cushion, armrests and a seat at knee level.

Many patients have trouble with constipation after surgery caused by pain medication and anesthesia. The week before surgery eat foods high in fiber including fruits, vegetables, beans and whole-grain cereals and breads. Drink water; 8 to 10 glasses of fluid every day. Walking also helps the intestines move more rapidly and regularly. Over-the-counter fiber supplements such as Metamucil, Fibercon and Citrucel can help keep stools soft and regular. Don't rely on laxatives, such as Correctol or Dulcolax, which cause muscle contractions in the intestines.

Who will stay with me?

Most patients go home 2 to 3 days after surgery. Identify someone who can be with you for the first week and help drive for you, take care of pets, housework, cooking, and shopping.

What to bring to the hospital

- Your medication list (prescriptions, over-the-counter, and herbal supplements) with dosages and the times of day usually taken.
- Bring a list of allergies to medications or foods.
- Bathroom items
- Co-pay for prescriptions. Leave all other money at home.
- CPAP machine (if you use one at home)
- Brace (if you've been given one)
- Personal items (book, music) to help you relax
- Wear loose fitting clothes and flat-heeled shoes with closed backs
- Leave all valuables and jewelry at home (including wedding bands)

Night before surgery

- Do not drink any alcoholic beverages.
- If you have a cold, fever, or some other illness the day before surgery, please call your surgeons office.
- No food or drink is permitted past midnight.
- Shower using antibacterial soap and dress in freshly washed clothing.

What happens during surgery?

Morning of surgery

- Shower again using antibacterial soap and dress in freshly washed clothing.
- You may brush your teeth.
- If you have instructions to take regular medication the morning of surgery, do so with small sips of water.
- Remove make-up, body piercings and nail polish.
- Arrive at the hospital 2 hours before (surgery center 1 hour before) your scheduled surgery time to complete the necessary paperwork and pre-procedure work-ups.

At the hospital

The nurse will ask you to remove your clothing (including underwear and socks) and to put on a hospital gown. In addition, you should remove any contact lenses, dentures, wigs, hairpins, jewelry or artificial limbs. Please give these and other personal belongings to your visitors to hold while you are in surgery and until you are in your assigned room.

An anesthesiologist will talk with you and explain the effects of anesthesia and its risks. An intravenous (IV) line will be placed in your arm. You will be given antibiotics to decrease the risk of infection.

You will be transported to the Operating Room on a stretcher. At that time, the nurse will direct your visitors to the Surgery Waiting Area. When surgery is over, your doctor will phone your visitors there.

Once in the OR you will be given anesthesia. Your surgery will take several hours. This time frame includes the skin preparation, positioning and anesthesia time.

What happens after surgery?

You will wake up in the recovery area called the post-anesthesia care unit (PACU). You may have a sore throat from the tube used during surgery to assist your breathing. You may feel tired, thirsty, cold, or have a dry mouth. Once awake you will be moved to a regular room.

Pain

Pain and anti-nausea medication will be given as needed. Pain medication may be given in different ways:

- Through your IV line by the nurse
- Through your IV line by a patient controlled analgesia (PCA) pump. PCA allows you to deliver pain medication when you need it. Limits are set for safety. You cannot overdose. A PCA pump is usually stopped the first day after surgery when you are able to take pills.
- By an injection into a muscle
- By pills once you are able to eat and drink

Everyone feels pain differently. Only you know how to describe your pain. Your healthcare team will ask you to rate your pain on a scale of 1 to 10. 1 = mild pain and 10 = worst possible pain. Using the scale, you will be asked to decide your comfort goal number.

Nursing care

Your blood pressure, pulse, temperature and breathing will be checked at intervals. The nurse will also examine your incision, change the dressing and check your circulation. You will be given antibiotics through your IV after surgery. Good nutrition and keeping your incision clean and dry helps prevent infection.

You will not be able to eat or drink right away. An IV will give you fluids for hydration. You may have ice chips to wet your mouth. The nurse will increase your diet once you are passing gas and there is movement in your stomach.

You may have a catheter to drain your bladder. It will be taken out the first day after surgery.

Respiratory therapy will monitor your breathing. You will be shown how to use a breathing aid (incentive spirometer) to help keep your lungs healthy after anesthesia. Breathing deeply and coughing helps clear air passages and reduces the risk of pneumonia.

Mobility

Being out of bed and walking several times a day is very important to your recovery. At first, you may need help, but gradually you'll increase your activity level (sitting in a chair, walking). A therapist will also show you how to use the toilet and shower, get in and out of bed.

In special cases, the surgeon may order a brace for extra support. If required, you will be shown how to put on the brace and how it is to be worn (see [Braces for Your Neck and Back](#)).

Preventing blood clots

Deep vein thrombosis (DVT) is a potentially serious complication of surgery in which blood clots form inside the veins of your legs. The clots may break free and travel to your lungs, causing collapse or even death. Being less active slows blood flow to the legs. If your blood is moving it is less likely to clot, so an effective treatment is getting you out of bed as soon as possible.

There are several ways to treat or prevent blood clots. You will wear tight fitting elastic socks called TEDS. Compression boots sequentially squeeze and release the legs to keep the blood from pooling in the veins. Drugs such as aspirin, Heparin, Lovenox, or Coumadin are also commonly used.

Going home

Depending on the type of fusion, some patients go home the same day while others may go home in 2 to 4 days. In some cases a home health care provider may need to be hired to help for a period of time. For those who need advanced help, transfer to a transitional care or short-term rehabilitation facility may be arranged.

When you are ready to go home, you will be given discharge instructions:

Discomfort

1. After surgery, pain is managed with narcotic medication. Because narcotic pain pills are addictive, they are used for a limited period (4 to 8 weeks). Also, their regular use may cause constipation, so drink lots of water and eat high fiber foods. Stool softeners (e.g., Colace, Docusate) and laxatives (e.g., Dulcolax, Senokot, Milk of Magnesia) can be bought without a prescription. Thereafter, pain is managed with acetaminophen (e.g., Tylenol).
2. Do not drink alcohol or operate a vehicle while using pain medication.
3. Pain medications will not be refilled on evening or weekends, so plan accordingly. If you need a refill, call at least 48 hours before your bottle will be empty.
4. Leg pain can come back around the 5th to 7th day after surgery. It may go on intermittently for a period of time.

Restrictions

5. Do **not** use non-steroidal anti-inflammatory drugs (NSAIDs) (e.g., aspirin; ibuprofen, Advil, Motrin, Nuprin; naproxen sodium, Aleve) for six months after surgery. NSAIDs may cause bleeding and interfere with bone fusion.
6. Do not drive for 2 to 4 weeks after surgery or until discussed with your surgeon.
7. Avoid sitting for long periods of time. Stand or take a few steps every 20 minutes.
8. Do not lift anything heavier than 10 pounds (e.g., gallon of milk). Do not bend or twist at the waist.
9. Housework and yard-work are not permitted until the first follow-up office visit. This includes gardening, mowing, vacuuming, ironing, and loading/unloading the dishwasher, washer, or dryer.
10. Postpone sexual activity until your follow-up appointment unless your surgeon specifies otherwise.
11. Do **not** smoke. Smoking delays healing by increasing the risk of complications (e.g., infection) and inhibits the bones' ability to fuse.
12. Do not sit in tub baths, hot tubs, swimming pools, or lakes until your health care provider says it's safe to do so.

Activity

13. You may need help with daily activities (e.g., dressing, bathing) for the first few weeks. Fatigue is common. Let pain be your guide.
14. Gradually return to your normal activities. Walking is encouraged; start with a short distance the first 2 weeks. Then gradually increase to 1 to 2 miles daily. Physical therapy may be recommended.
15. Sit in a firm chair with arm rests. Use a support cushion in the small of your back as needed.
16. Log roll in and out of bed as you did in the hospital. Lie on your back with a pillow under your knees. Lie on your side with a pillow between your knees.
17. If applicable, know how to apply the brace before leaving the hospital. Wear it for daily activities (excluding sleep) unless instructed otherwise.

Bathing/Incision Care

18. You may shower after surgery unless instructed otherwise. No tub baths.
19. Steri-strips may cover the incision. After showering, gently pat dry the steri-strips. Gently remove steri-strips after one week. Staples or stitches that remain in place when you go home will need to be removed. Ask your surgeon or call the office to find out when.
20. Keep your dressing clean and dry.
21. Change the dressing daily. Wash your hands before and after.
22. Check for signs of infection such as swelling, redness, yellow or green discharge, warm to the touch.
23. Do not apply creams, lotions or ointments on or near your incision.

When to Call Your Doctor

24. If your temperature exceeds 101.5° F or if the incision begins to separate or show signs of infection, such as redness, swelling, pain, or drainage.
Call _____
25. Make an appointment for a follow-up visit 2 to 4 weeks after surgery unless otherwise instructed. Call the appointment desk at 513-221-1100.

Special instructions / notes

Recovery and prevention

You will need to set up an appointment for a follow-up visit with your doctor two weeks after surgery. You may be given light stretching exercises to do on your own. Your level of commitment to exercise will determine how fast and how well you recover.

About six weeks later, routine visits should start with physical therapy to begin your rehabilitation. A physical therapy program will likely include exercises to strengthen your back and low-impact aerobics, such as walking or swimming.

Your physical therapist will show you how to make modifications to your daily standing, sitting, and sleeping habits—for example, learning how to lift properly or sitting for shorter periods of time. Regular back exercises strengthen muscles that support your spine, easing pain and preventing further injury.

Recurrences of back pain are common. The key to avoiding recurrence is prevention:

- Proper lifting techniques
- Good posture during sitting, standing, moving, and sleeping
- Appropriate exercise program
- An ergonomic work area
- Healthy weight and lean body mass
- A positive attitude and relaxation techniques (e.g., stress management)
- No smoking

Most people who have spinal fusion surgery are off work for approximately 6 to 12 weeks. You may or may not need to return to work with restrictions based upon your job. If you have a physically demanding position, you may need to be on restrictions when you return.

Sources & links

If you have more questions, please call the Mayfield Spine Institute at 800-325-7787 or 513-221-1100.

Links

www.spine-health.com
www.spineuniverse.com

Sources

1. Brown CW, Orme TJ, Richardson HD. The rate of pseudarthrosis (surgical nonunion) in patients who are smokers and patients who are nonsmokers: a comparison study. *Spine* 9:942-3, 1986

Glossary

allograft: a portion of living tissue taken from one person (the donor) and implanted in another (the recipient) for the purpose of fusing two tissues together.

annulus (annulus fibrosis): tough fibrous outer wall of an intervertebral disc.

autograft (autologous): a portion of living tissue taken from a part of one's own body and transferred to another for the purpose of fusing two tissues together.

bone graft: bone harvested from one's self (autograft) or from another (allograft) for the purpose of fusing or repairing a defect.

bone spurs: bony overgrowths that occur from stresses on bone, also called osteophytes.

cancellous bone: (sometimes called trabecular bone) the spongy bone found beneath the hard outer bone that is rich with bone-growing proteins.

cortical bone: outer layer of dense, compact bone.

facet joints: joints located on the top and bottom of each vertebra that connect the vertebrae to each other and permit back motion.

fusion: to join together two separate bones into one to provide stability.

instrumentation: titanium, stainless steel, or non-metallic devices implanted in the spine to increase stability. Includes hooks, rods, plates, screws, and interbody cages.

osteoblasts: the bone-building cells in bone.

osteoclasts: the bone-removing, or resorption, cells in bone.

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