Preparing for Lumbar Spinal Fusion

Overview

Spinal fusion is a surgery that permanently joins together one or more bony vertebrae of the spine. Abnormal movement of the vertebrae rubbing against one another may result in back, leg, or arm pain. Fusing the bones together stabilizes and aligns the spine, restores the normal disc space between the bones, and prevents further damage to the 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.

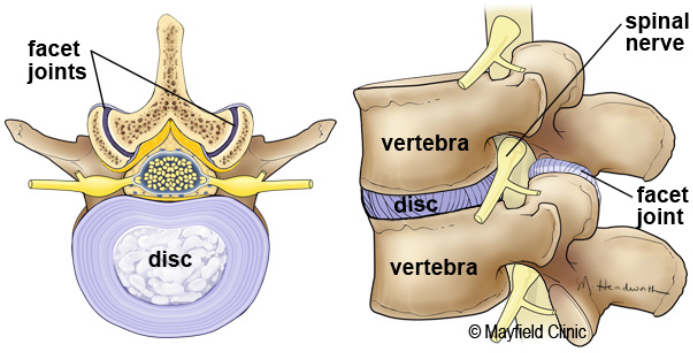
What you do before and after surgery can help get you back on your feet sooner. It's important to have realistic expectations and prepare properly for your recovery.

What is spinal fusion?

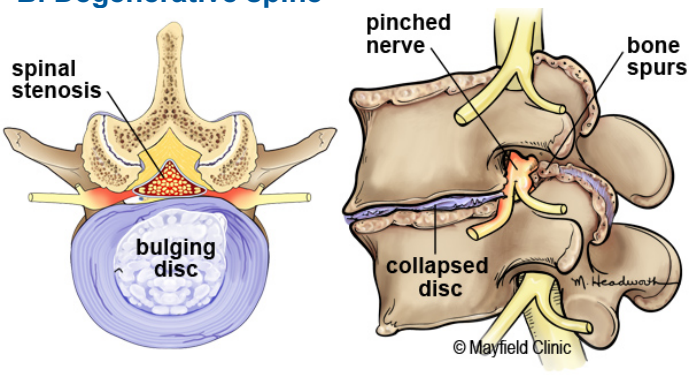
At each level of the spine, there is a disc space in the front and paired facet joints in the back. Working together, these structures define a motion segment (Fig. 1A). Back pain may result when injury or degenerative changes allow abnormal movement of the vertebrae to rub against one another, known 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. A two-level fusion joins three vertebrae together and so on.

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 cage devices. For fusion to occur between two vertebrae, a bone graft is needed to serve as a bridge. The bone graft must be placed in a "bed" where the disc nucleus has been removed and the cortical bone drilled to expose the blood-rich cancellous bone inside (Fig. 1C).

A. Normal spine



B. Degenerative spine



C. Spinal fusion

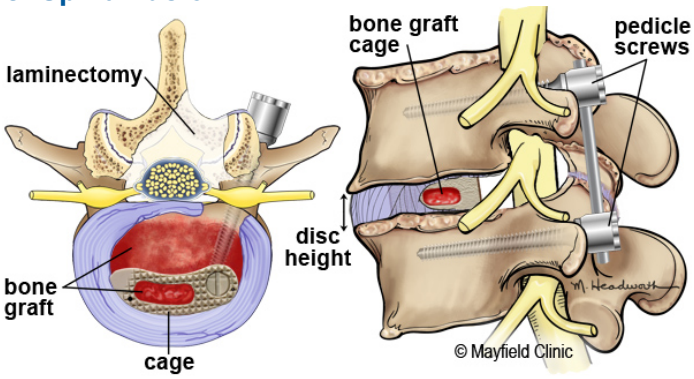


Figure 1. A. Normal spine. B. Degenerative spine disease impairs the disc and facet joints causing spinal instability and back pain. C. Spinal fusion restores the normal height of the disc space and prevents abnormal movement.

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, 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 (Fig. 2). 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 to have a physical exam from your primary care physician before surgery to confirm your heart and lungs are healthy. A blood test, electrocardiogram (EKG), and chest X-ray may 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 7-10 days 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

Do not drink alcohol 1 week before and 2 weeks after surgery to avoid bleeding problems.

The hospital will call you several 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 way to achieve a successful spinal fusion surgery is to quit smoking. Stop all tobacco use: cigarettes, e-cigarettes, cigars, pipes, chewing tobacco, and smokeless tobacco (snuff, dip). Nicotine prevents bone growth and decreases successful fusion. Fusions fail in 40% of smokers compared with 8% of non-smokers [1]. Smoking also decreases blood circulation, resulting in slower wound healing and an increased risk of infection.

Talk with your doctor about nicotine replacements, pills without nicotine (Wellbutrin, Chantix), and tobacco counseling programs.

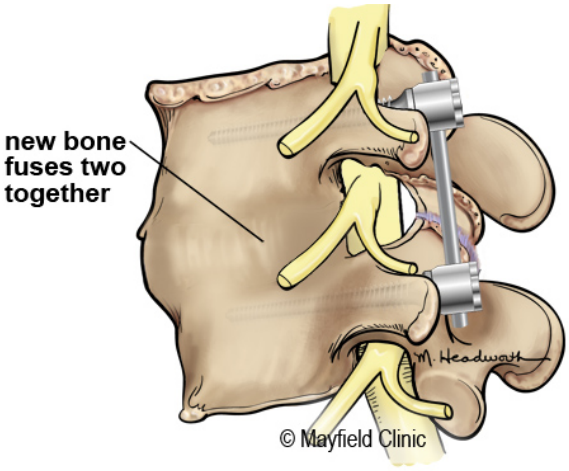


Figure 2. After 3 to 6 months new bone growth will fuse the two vertebrae into one solid piece of bone.

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 remove 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. If your toilet is low, get a raised toilet seat. Identify a chair with a firm cushion, armrests and a seat at knee level that is easy to get out of.

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 couple days and help you move around, 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
- 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.
- No food or drink is permitted past midnight.
- If you have a cold, fever, flu or some other illness the day before surgery, call your surgeon's office.
- Shower with antibacterial soap (Dial, Hibiclens) and wear freshly washed clothing.
- Confirm your transportation home because you will not be able to drive yourself.

What happens during surgery?

Morning of surgery

- Shower again using antibacterial soap and dress in freshly washed clothing.
- You may brush your teeth. Do not eat or drink.
- 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 check you in and show you to a room. You will be asked to remove your clothing (including underwear and socks) and put on a surgical 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 talk with 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. Everyone feels pain differently. Only you know how to describe your pain. Your healthcare team may ask you to rate your pain on a scale of 1 to 10. 1 = mild pain and 10 = worst possible pain.

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 is usually removed 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 some 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.

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 healthcare 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:

Pain medication

- Take pain medication as directed by your surgeon. Narcotics can be addictive and are used for a limited period of time.
- Narcotics can also cause constipation. Drink lots of water and eat high-fiber foods. Laxatives and stool softeners such as Dulcolax, Senokot, Colace, and Milk of Magnesia are available without a prescription.
- Do **not** use non-steroidal anti-inflammatory drugs (NSAIDs) (aspirin, ibuprofen, Advil, Motrin, Nuprin, naproxen, Aleve) without surgeon's approval. They prevent new bone growth and may cause your fusion to fail.
- You may take acetaminophen (Tylenol).

Restrictions

- Avoid bending, lifting or twisting your back for the next 2 weeks.
- Do not lift anything heavier than 5 pounds for 2 weeks after surgery.
- No strenuous activity for the next 2 weeks, including yard work, housework and sex.
- **DO NOT SMOKE**, vape, dip, chew or use nicotine products. It prevents new bone growth and may cause your fusion to fail.
- Do not drive until after your follow-up appointment. You may ride in the car for short distances of 45 minutes or less if necessary.
- Do not drink alcohol for 2 weeks after surgery or while you are taking narcotic medication.

Incision Care

- Wash your hands thoroughly before and after cleaning your incision to prevent infection.
- If you have Dermabond (skin glue) covering your incision, you may shower the day after surgery. Gently wash the area daily with soap and water. Pat dry.
- If you have staples, steri-strips, or stitches, you may shower 2 days after surgery. Remove the gauze dressing and gently wash the area with soap and water. Replace the dressing or completely remove it if no drainage. Inspect and wash the incision daily.
- Do not submerge or soak the incision in water (bath, pool or tub).
- Do not apply any lotions or ointments over the incision.
- Some drainage from the incision is normal. A large amount of drainage, foul smelling drainage, or drainage that is yellow or green should be reported to your surgeon's office immediately.

Activity

- Get up and walk 5-10 minutes every 3-4 hours. Gradually increase your walking time, as you are able. Avoid sitting for long periods of time.
- 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.

Icing

- Ice your incision 3-4 times per day for 15-20 minutes to reduce pain and swelling.

Bracing

- If you were given a brace, wear it at all times unless you are sleeping or showering.

When to Call Your Doctor

- Fever over 101.5° F (unrelieved by Tylenol)
- Incision begins to separate or show signs of infection, such as redness, swelling, pain, or drainage.
- Rash or itching at the incision (allergic reaction to Dermabond skin glue).
- Swelling and tenderness in the calf of one leg.
- New onset of tingling or numbness in the arms or legs.

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 several weeks depending on the type of work you do and the surgical procedure. 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 Mayfield Brain & Spine at 800-325-7787 or 513-221-1100.

Links

http://www.spine-health.com
http://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 ones own body and transferred to another for the purpose of fusing two tissues together.

bone graft: bone harvested from ones 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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