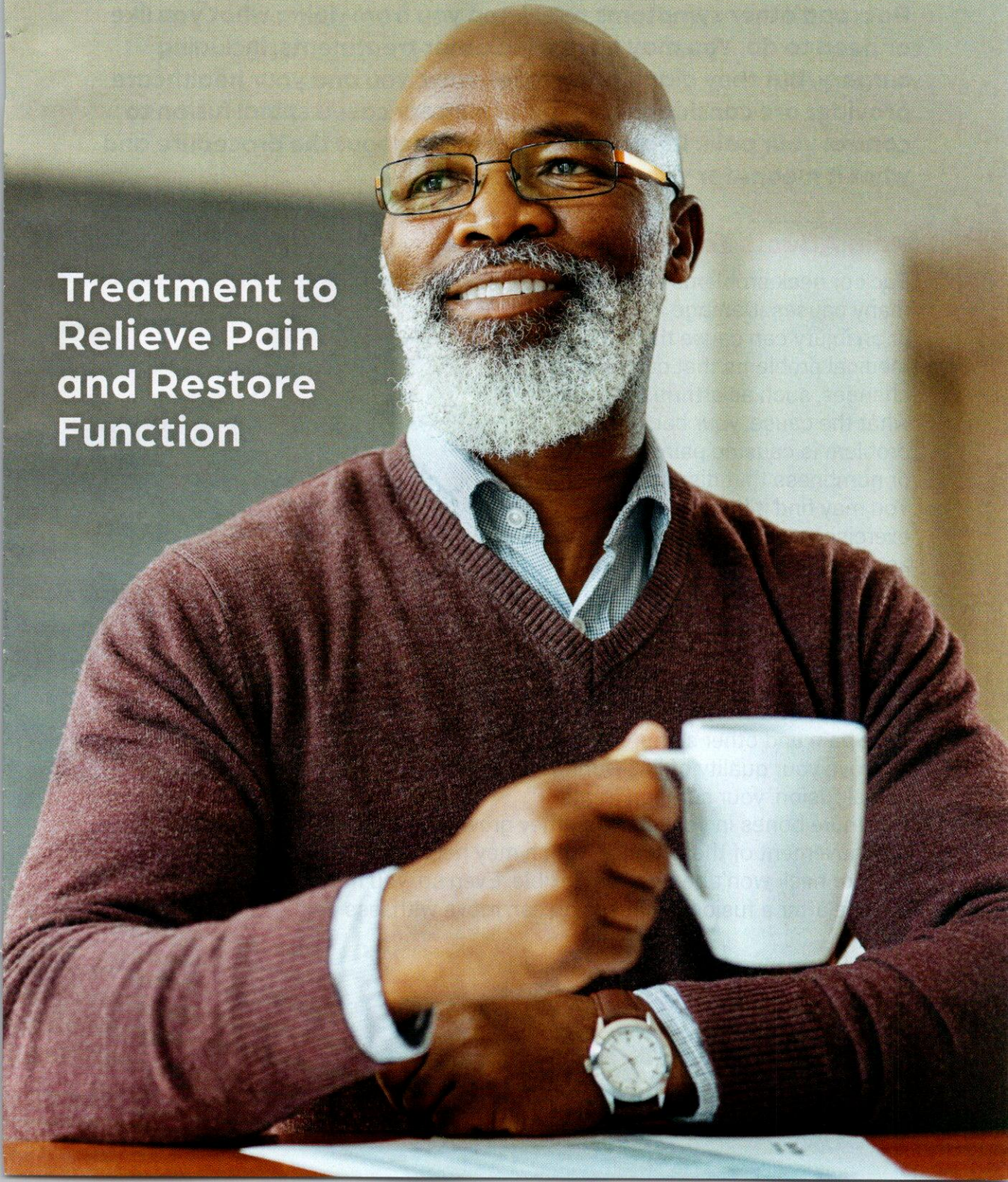


Spinal Fusion

Treatment to
Relieve Pain
and Restore
Function



Relief from Back or Neck Pain

Living with a painful back or neck can be frustrating. Pain and other symptoms may keep you from doing what you like or need to do. You may have tried other treatments, including surgery, but they didn't bring relief. Now, you and your healthcare provider are considering a type of surgery called spinal fusion to control your pain. Read on to learn more about the procedure and what it means for you.

Pain Affects Your Life

Back or neck problems can have many causes. Damage from overuse or an injury can cause them. So can medical problems that cause spine changes, such as arthritis. No matter what the cause, your back or neck problem is causing pain, weakness, or numbness that disrupts your life. You may find it hard to do your job, to exercise, or to keep up with daily activities. Your family and social life may be strained as a result.

Fusion Surgery Can Help

The goals of fusion surgery are to ease pain and other symptoms and improve your quality of life. During spinal fusion, your surgeon treats 2 or more bones in your spine so they grow together (**fuse**). This limits the movement of these bones, which may help relieve your pain. Your back or neck won't be quite as flexible. Even so, you may *feel* more flexible after a fusion because you can move with less pain.



Understand Your Role

You and your provider will discuss the benefits and risks of fusion surgery for you. Be clear how you hope surgery will help. Ask what range of pain relief and function you might expect after surgery. Also keep in mind:

- Recovery from fusion surgery takes time. It may be many months before you heal completely.
- After surgery, you will be asked to limit activities that put stress on your back or neck.
- A formal physical therapy program may be needed after surgery. This helps improve strength and mobility.
- You will have the best results if you take an active role in preparing for surgery and recovering afterward.

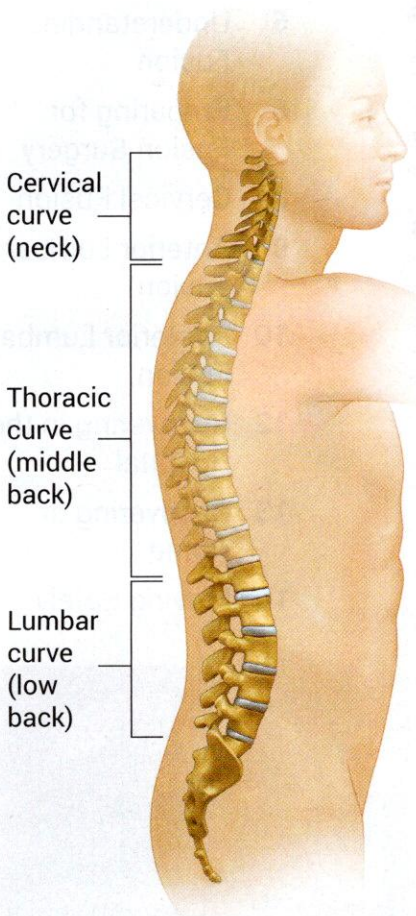
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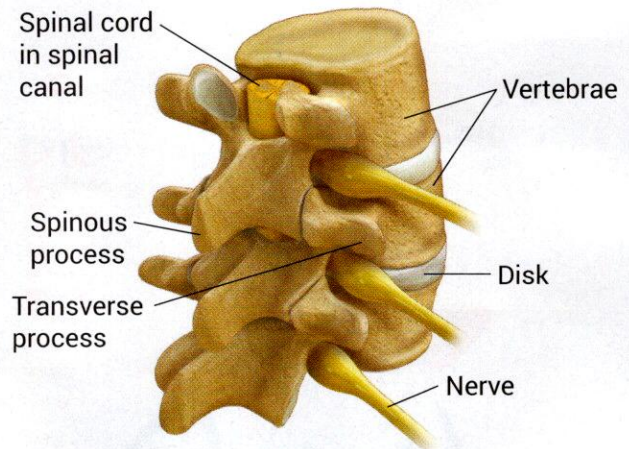
Anatomy of the Spine

The spine is made of bones (vertebrae) with soft cushioning (disks) between them. This makes the spine strong and flexible.



The Parts of the Spine

- The **vertebrae** are the bones that connect like puzzle pieces to make up the spine.
- The **transverse process** is the wing of bone on each side of the vertebra.
- The **spinous process** is the part of each vertebra you can feel under your skin.
- A **disk** lies between each pair of vertebrae, cushioning them.
- The **spinal canal** is a tunnel formed within the stacked vertebrae. The **spinal cord** runs through this canal. **Nerves** branch off the spinal cord and exit between the vertebrae.



The spine has 3 natural curves: the cervical curve, the thoracic curve, and the lumbar curve.

Movement Can Lead to Pain

The vertebrae move independently but in sync to give your spine flexibility. In some cases, too much movement of diseased spinal disks or vertebrae can lead to pain and other symptoms.

Understanding Fusion

Spinal fusion surgery makes the spine more stable. It is done to help ease symptoms of back and neck problems. During the surgery, a substance called bone graft is put between 2 or more vertebrae. Over time, bone graft and nearby bone fuse (grow into a solid unit).

Types of Fusion Surgery

Your provider will determine which vertebrae to fuse. Fusing vertebrae in the neck is called **cervical fusion**. Fusing vertebrae in the low back is called **lumbar fusion**. Fusion can be done from the front of the spine (**anterior fusion**) or the back of the spine (**posterior fusion**). In some cases, both approaches are used. Your surgeon will recommend the best approach for you.

Bone Graft

Bone graft is what allows the vertebrae to grow together. Bone graft may be small pieces of bone taken from your own body. It may be from a human donor who has died. Or, it may be artificial bone substitute. Your surgeon will choose the type of graft that's best for you.

- **If bone from a donor is used:** Bone from donors is collected and stored by a bone bank. Donated bone is screened carefully to ensure it is healthy and carries no disease.
- **If bone from your own body is used:** This may be bone removed from your spine or taken from your pelvic bone. Bone from your own body may work better than donor or bone substitute.

If bone is taken from your pelvis, the area can hurt quite a bit until it heals.



Front of
pelvic
bone

Preparing for Fusion Surgery

Once surgery is scheduled, **plan ahead for the procedure and your recovery. If you have questions, be sure to get them answered. Discuss the risks of surgery with your surgeon. Learn what surgery can and cannot do for you. Having realistic expectations is key to a good result.**

Planning Ahead

The better prepared you are for surgery, the smoother your recovery is likely to be. Follow all instructions you are given. Also:

- Stop smoking. Smoking can slow healing and affect the results of your surgery. If you smoke, ask your surgeon for advice on stopping before surgery.
- Arrange for family and friends to help you with errands and household chores after surgery. Driving and certain other daily activities will likely be restricted for a time.
- Ask your surgeon how long you will need to be away from work.
- Prepare your home. Move items to where you can get them without reaching or bending. Pick up clutter. Remove throw rugs. Tape down electrical cords.



Before Surgery

- Tell your provider what prescription and over-the-counter medicines, supplements, vitamins, or herbal remedies you take. This includes aspirin, ibuprofen, and other NSAIDs. It also includes medicines to prevent blood clots. Ask if you should stop taking any of them before surgery.
- Talk with your provider about ways to manage possible blood loss. This may include donating blood ahead of time in case you need a transfusion during surgery.
- Arrange for an adult family member or friend to give you a ride to and from surgery. If you live alone, have someone prepared to stay with you for 1 to 2 nights afterward.
- Don't eat or drink anything for as long as instructed before surgery.

The Day of Surgery

Arrive at the hospital on time. An **intravenous line (IV)** will be placed in your arm or hand. This delivers fluids and medicines. You may be given an IV medicine to help you relax. Your incision site will be marked. You may also be asked more than once for your name and what procedure you're having. This is for your safety. Just before surgery, you'll be given **anesthesia** (medicine to prevent pain during surgery). You will likely receive general anesthesia, which puts you into a state like deep sleep.



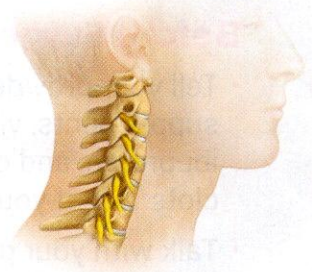
Risks and Complications

The risks and possible complications of spinal fusion surgery include:

- Infection
- Nerve or spinal cord damage
- Bone graft shifting out of place or not fusing
- Blood clots
- Bowel or bladder dysfunction
- Implant breakage
- Paralysis

Cervical Fusion

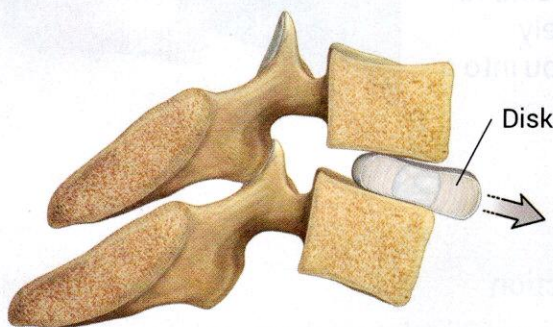
To help ease neck and arm pain, 2 or more vertebrae in the neck are fused. This may be done through an incision in the front (anterior) of the neck or the back (posterior) of the neck.



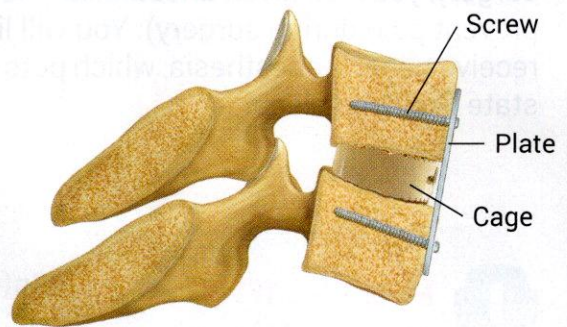
Cervical vertebrae

The Fusion Procedure

- **For an anterior fusion.** An incision is made on the front of the neck to reach the spine. Most of the disk is removed from between the vertebrae. Then, bone graft is placed. It is often put inside a device called a cage. The cage is placed between the vertebrae.
- **For a posterior fusion.** An incision is made on the back of the neck. Bone graft is then placed on the back of the spine between the transverse processes.
- In either case, a metal plate or rod and screws may be added. These hold the spine steady as the bone graft fuses with the vertebrae. The supports typically stay in place and are not removed.
- The incision is closed with sutures, staples, or surgical glue.



The disk is removed from between the vertebrae.



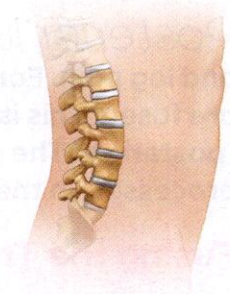
Bone graft inside a cage is placed in the empty space. A metal plate and screws may be used to give extra support.

Anterior Lumbar Fusion

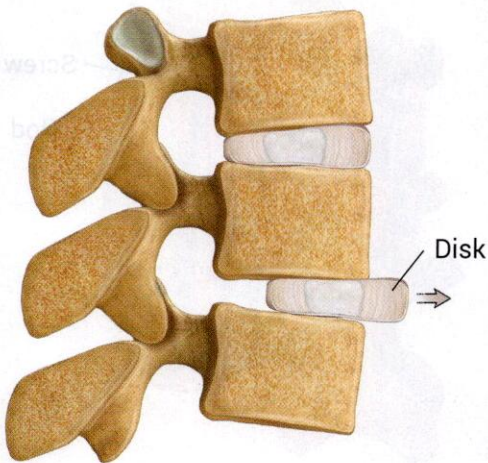
Anterior lumbar fusion may help ease low back and leg pain. For this, 2 or more vertebrae in the low back are fused. This is done through an incision in the front (anterior) of the body.

The Fusion Procedure

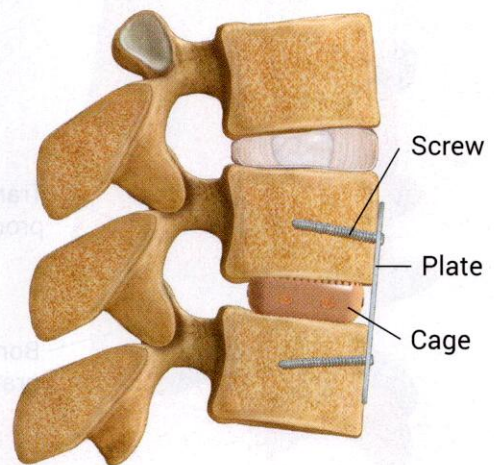
- An incision is made in the abdomen to reach the spine.
- Most of the disk is removed from between the vertebrae.
- Bone graft is placed. It is usually put inside a device called a cage. The cage filled with bone graft is placed in the space between the vertebrae.
- To hold the spine steady as the bone graft fuses with the vertebrae, a metal plate and screws may be added. These typically stay in place and are not removed.
- The incision is closed with sutures, staples, or surgical glue.



Lumbar vertebrae



The disk is removed from between the vertebrae.



Bone graft inside a cage is placed in the empty space. A metal plate and screws may be used to give extra support.

Posterior Lumbar Fusion

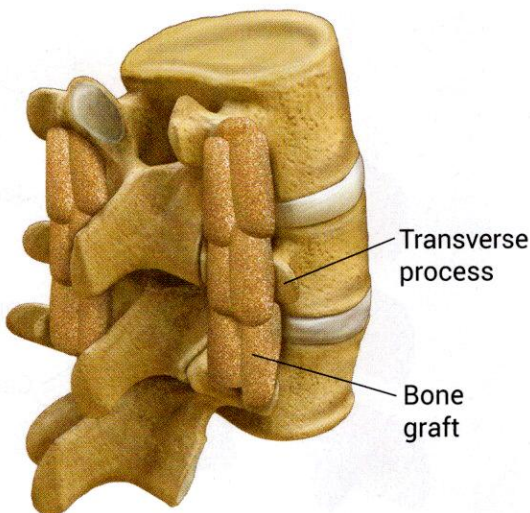
Posterior lumbar fusion may help ease low back and leg pain. For this, 2 or more vertebrae in the low back are fused. This is done through an incision in your low back (posterior). The graft may be put between the transverse processes, in the disk space, or both.



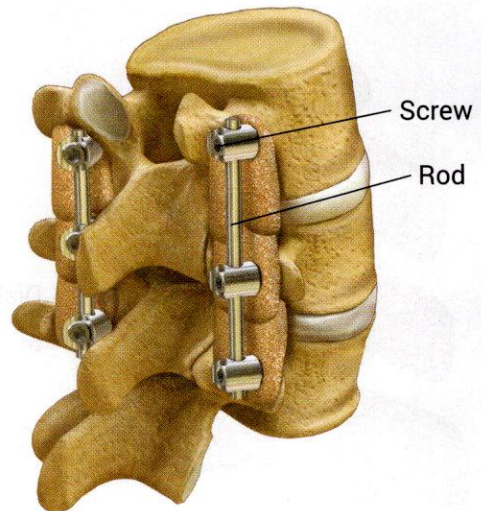
Lumbar vertebrae

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.



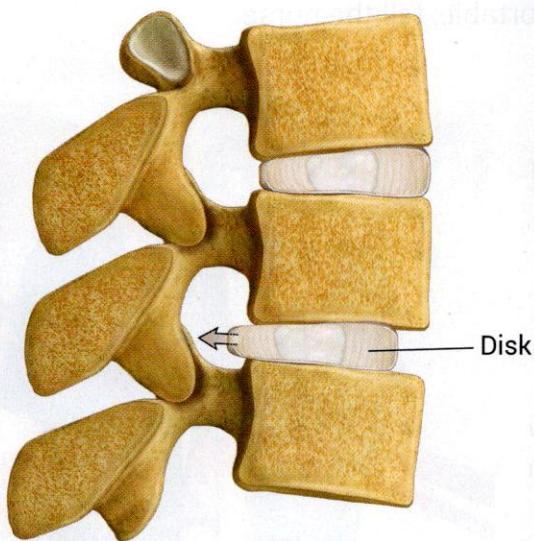
Bone graft is placed between the wings of bone on the sides of the vertebrae.



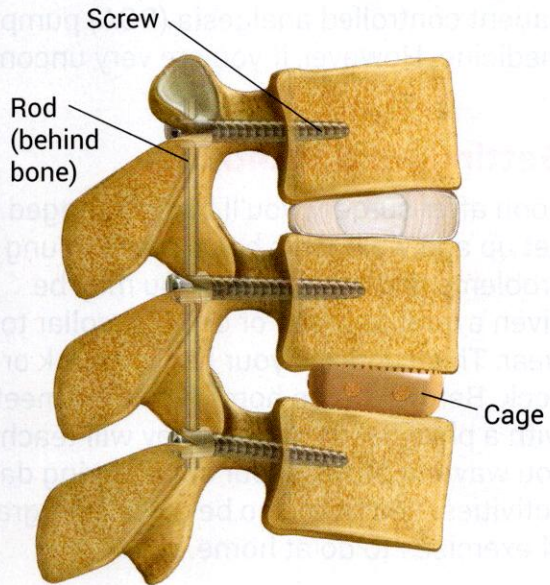
Metal screws and rods may be placed to give extra support.

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.

Recovering in the Hospital

After surgery, you'll likely stay in the hospital 1 or more nights. The length of your stay depends on what type of fusion you had, how many vertebrae were fused, and how well you're healing.

Right After Surgery

When you wake up from surgery, you may feel groggy, thirsty, or cold. Your throat may be sore. This is normal. The IV line will remain in place for most of your hospital stay. You may have tubes to drain blood and fluid from your incision. You may also have a tube called a catheter to drain your bladder. These stay in place for a few days. During your stay, you will wear compression stockings or use foot or leg pumps to help prevent blood clots.

Controlling Pain

You will be given medicine through the IV line to control pain. The nurse may give you the medicine. Or, you may control the medicine yourself with a patient controlled analgesia (PCA) pump. Some pain is normal, even with medicine. However, if you are very uncomfortable, tell the nurse.

Getting Up and Moving

Soon after surgery, you'll be encouraged to get up and walk. This helps prevent lung problems and blood clots. You may be given a lumbar brace or cervical collar to wear. This supports your healing back or neck. Before you go home, you may meet with a physical therapist. They will teach you ways to protect your spine during daily activities. You may also be given a program of exercises to do at home.



Recovering at Home

You will continue your recovery at home.

Healing after spinal fusion can take many months. Protect your healing spine during this time. Follow the guidelines on this page and any other directions you're given.

Use Pain Medicine as Directed

You'll be prescribed medicine for pain. Don't wait for the pain to get bad before you take your pain medicine. Take it as directed and on time.

Return to Movement

The right kind of movement helps your recovery. Follow the instructions your surgeon has given you. You may also work with a physical therapist. As you heal:

- Take 1 to 2 walks each day. Slowly increase your walking time from week to week.
- Do any exercises you have been given as instructed.
- Ask your surgeon what activities you shouldn't do.
- If you feel more pain than usual after activity, take it a little easier for a few hours.

See Your Surgeon

If you've had neck surgery, recovery takes about 3 months. For low back surgery, recovery takes about 6 months to a year. See your surgeon for checkups during this time. They can confirm that you are healing well. If you have concerns or questions, be sure to mention them during these visits.



When to Call Your Surgeon

Follow instructions for when to call your surgeon after surgery. Call if you have any of these:

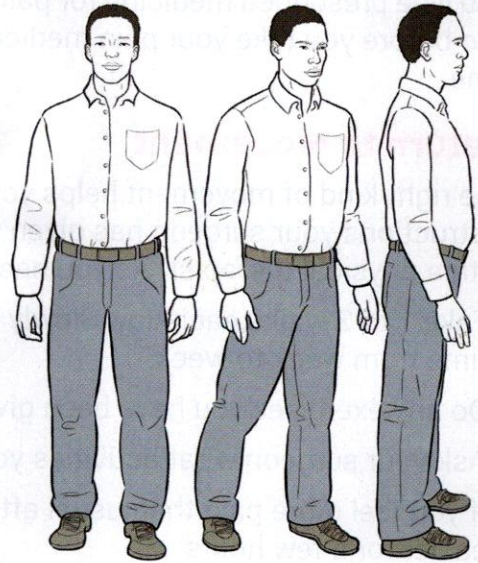
- Increasing pain, redness, or fluid leaking from your incision
- A fever of 100.4°F (38°C) or higher, or as directed by your provider
- New pain, weakness, or numbness in your legs or arms
- A severe headache
- Loss of bladder or bowel control

Moving Safely

Learning how to move safely can help protect your spine while it heals. After you heal, keep moving safely to help your neck and back stay healthy. Keep your ears, shoulders, and hips in line. Try the tips on these pages. Also, be sure to follow any other guidelines from your provider, surgeon, or physical therapist.

Standing and Turning

- Stand with 1 foot slightly in front of the other, as if you just took a step. Or, stand with your feet shoulder width apart.
- Keep your knees relaxed and your stomach muscles tight.
- Turn by moving your feet instead of twisting at the waist.



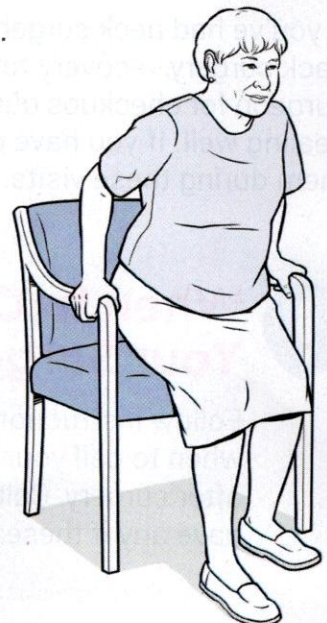
Getting In and Out of a Chair

To sit down on a chair.

- Back up to the chair. Tighten your stomach muscles.
- Lean forward from your hips (not from your waist).
- Use your leg muscles to lower yourself onto the front of the chair. Then, scoot back in the chair.

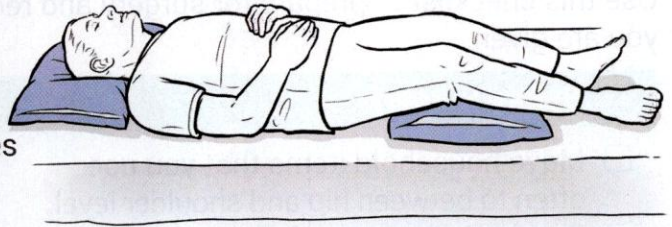
To get up from a chair.

- Scoot to the front of the chair. Tighten your stomach muscles. Place 1 foot slightly in front of the other.
- Hold the side of the chair or the armrests for support.
- Bend at the hips (not the waist). Use your leg muscles to push your body up.



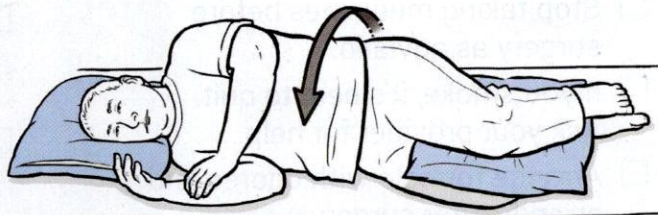
Lying in Bed

- Lie on your back with a pillow under your knees.
- Or, lie on your side with your knees bent and a pillow between them.



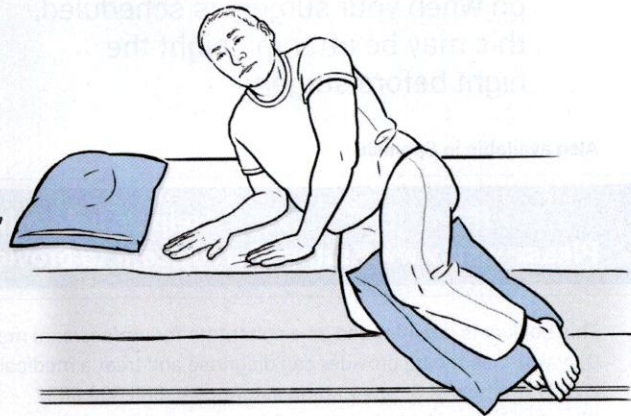
Turning in Bed

- Tighten your stomach muscles. Bend your knees slightly.
- Roll to one side like a log. Don't bend or twist at the waist.



Getting Out of Bed

- Tighten your stomach muscles. Turn onto your side.
- Slowly scoot to the edge of the bed.
- Push your body up with 1 elbow and the other hand. At the same time, gently swing both legs to the floor. Keep your stomach muscles tight.
- To stand up, follow the instructions for getting out of a chair.



Other Tips to Protect Your Spine

- To pick something up off the floor, keep your back straight and bend your knees.
- You may find it easier to dress and undress while lying on your back. Bend your knees and raise 1 leg at a time. A tool called a dressing reacher may help.
- Don't push, pull, or twist. Also don't lift anything heavy. Ask your surgeon for specific guidelines.
- Walk to stay in shape and to keep your spine healthy.

Work with Your Healthcare Team

Spinal fusion surgery may help ease your pain. Keep in mind that the decision to have surgery is up to you. Before you make that decision, know your treatment options. Learn the risks and benefits of surgery. Also understand what results you can expect. Work with your healthcare team to have all your questions answered before moving forward.

Your Surgery Checklist

Use this checklist to prepare for surgery and recovery. Follow any other instructions you are given.

Before Surgery	After Surgery
<ul style="list-style-type: none"><input type="checkbox"/> Move household items that you use often to between hip and shoulder level. This helps keep you from needing to reach or bend after surgery.<input type="checkbox"/> Stop taking medicines before surgery as advised.<input type="checkbox"/> If you smoke, it's best to quit. Ask your provider for help.<input type="checkbox"/> Arrange for help with chores and errands after surgery.<input type="checkbox"/> Stop eating and drinking before surgery as instructed. Depending on when your surgery is scheduled, this may be after midnight the night before surgery.	<ul style="list-style-type: none"><input type="checkbox"/> Take your pain medicine as directed.<input type="checkbox"/> If you were given a brace or collar, wear it as directed.<input type="checkbox"/> Care for your incision as directed. Do not get your incision wet until you're told it's okay to do so.<input type="checkbox"/> Ask when you can go back to driving. Also ask about returning to work and sex.<input type="checkbox"/> Follow instructions for returning to activity and exercising.<input type="checkbox"/> See your surgeon for scheduled follow-up visits.

Also available in Spanish

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