

Spinal Deformity Fusion Surgery

A guide for patients and their caregivers



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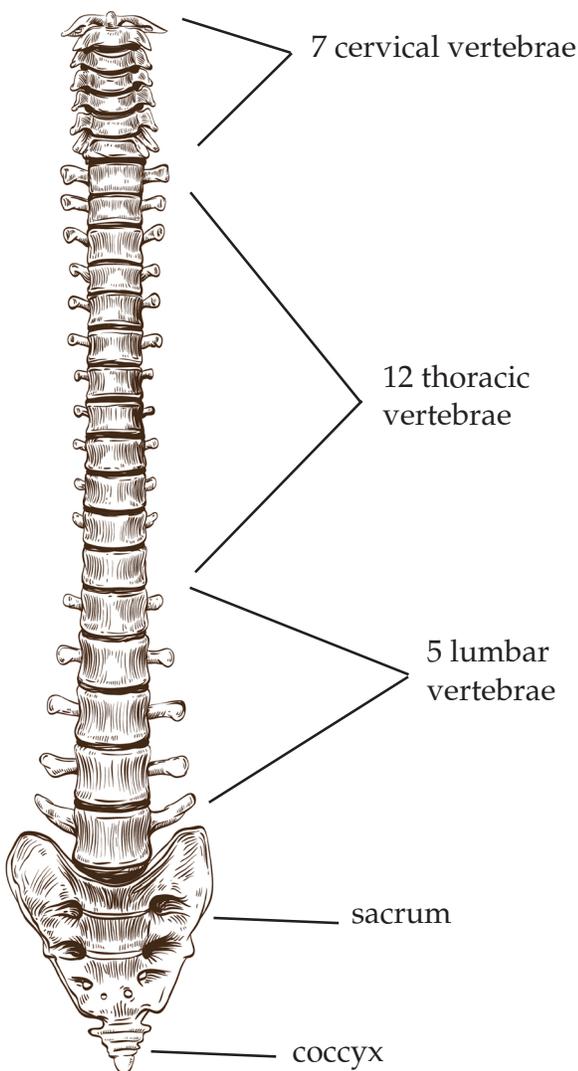
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About the Spine

The spine is a stack of bones that runs down the middle of your back. It starts at the bottom of your skull and goes all the way down to the end of your tailbone. The spine:

- supports your body
- allows you to move freely
- houses and protects the spinal cord—the nerve center of your body.

View of the spine from the front



The spine has 26 bones

- There are 24 bones (vertebrae) that start at the top of your spine. These are the separate bones that connect like puzzle pieces. There are:
 - 7 vertebrae in the neck area (cervical)
 - 12 vertebrae in the chest area (thoracic)
 - 5 vertebrae in the lower back (lumbar)
- The next to the last bone of your spine is the sacrum. The sacrum is actually 1 large bone made of 5 fused bones.
- The bone at the very end of the spine is the tailbone (the coccyx).

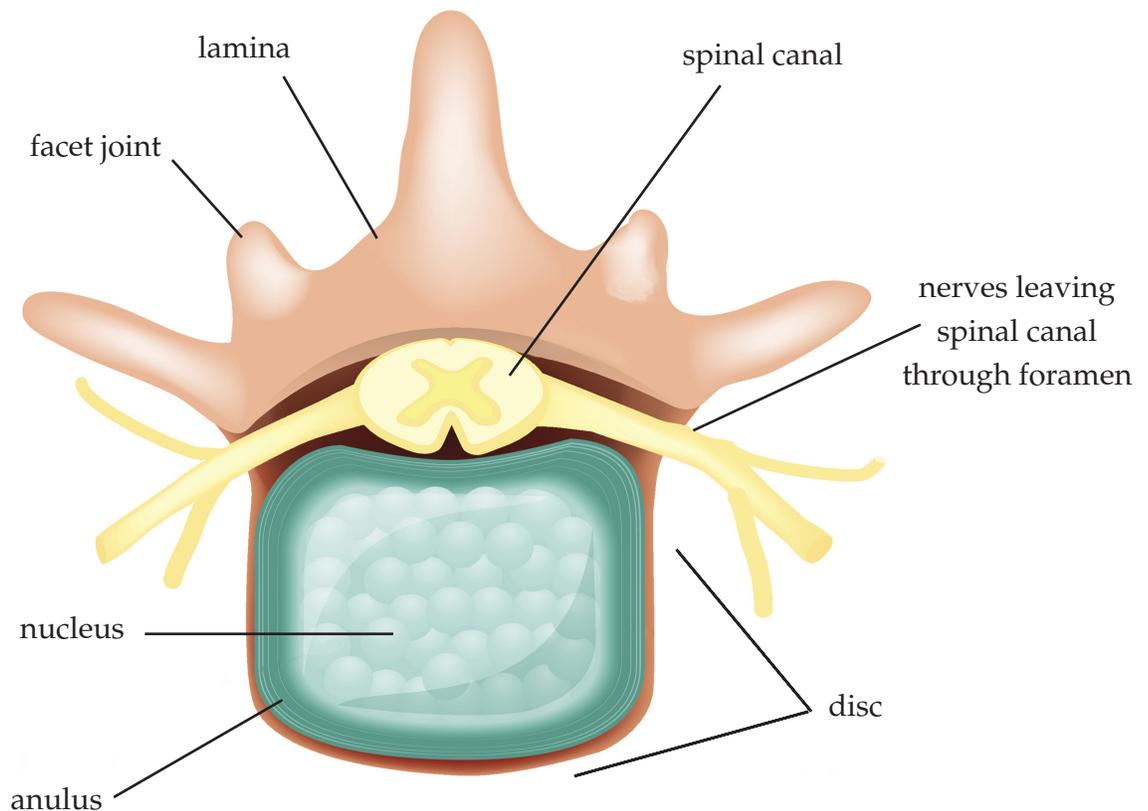
There are discs between most of the bones in the spine

There are soft pads of tissue between most of the vertebrae in your spine. These are called discs. The only vertebrae that do not have a disc between them are the top 2.

Details about the discs

- Each disc has a spongy center (nucleus) and a tougher outer ring (annulus). Movement in the nucleus is what makes it possible for the vertebrae to rock back and forth on the disks. This give you the flexibility you need to bend and move.
- The discs absorb shock caused by movement.
- The discs also keep the bones from rubbing up against each other when you move.

Cross-section of a vertebra and disc



The spine has 3 natural curves

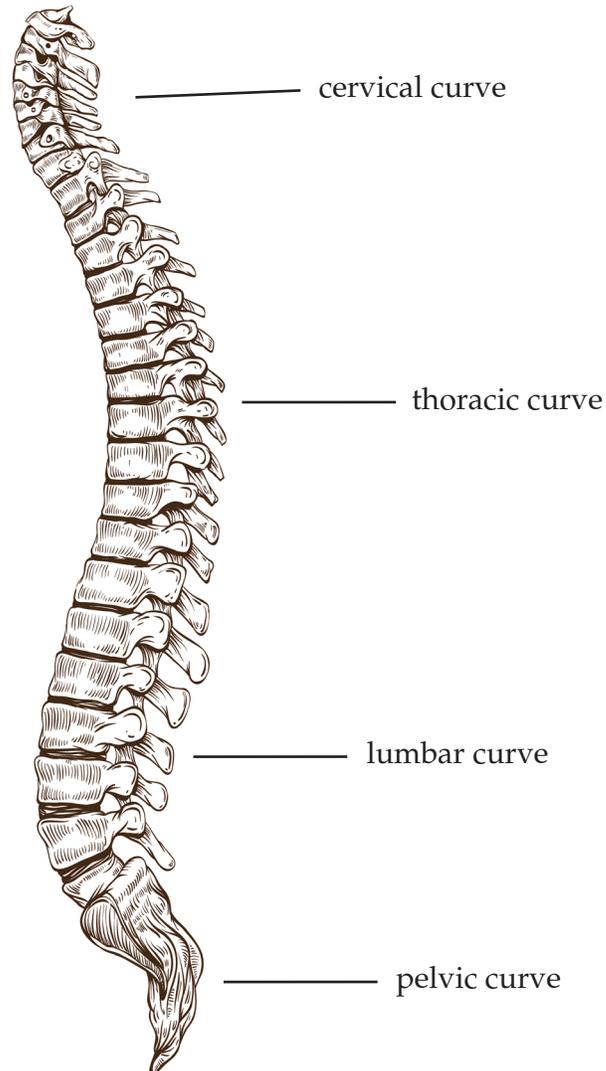
A healthy spine with proper alignment has 3 natural curves: cervical, thoracic, and lumbar.

- These curves keep your body balanced.
- These curves support your body when you move.
- These curves distribute weight through the spine, making back injuries less likely.

Muscles support the curves of the spine

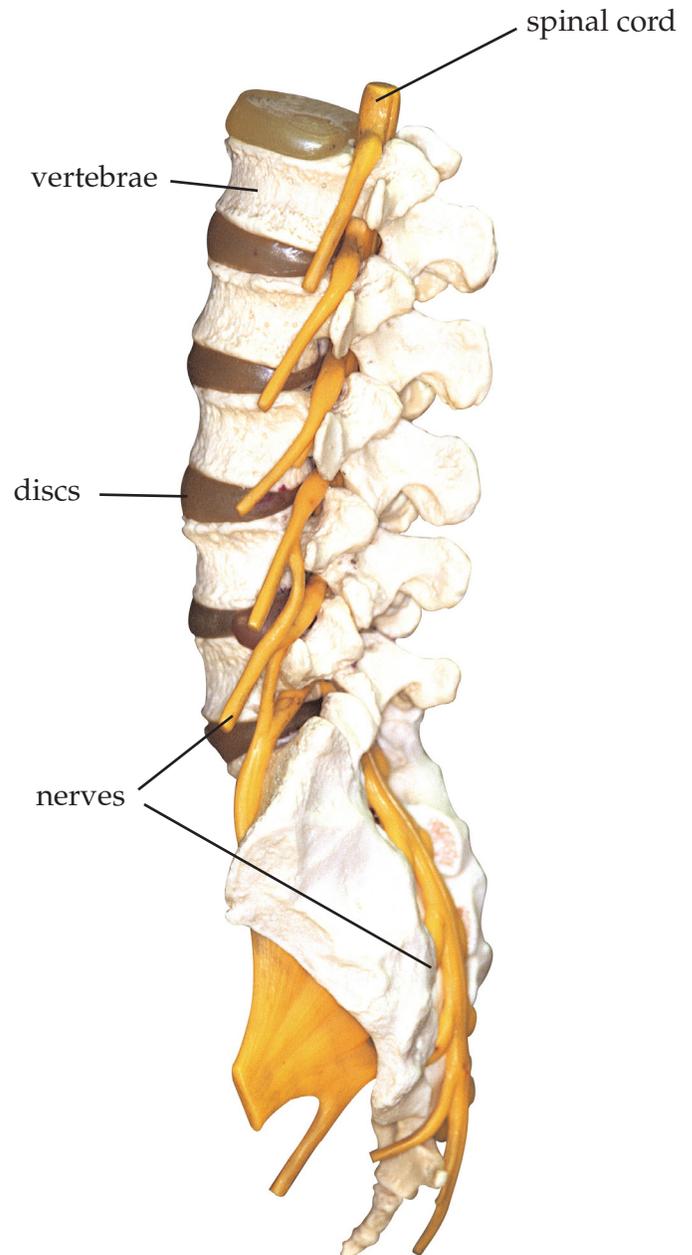
Strong, flexible back muscles help support the curves of your spine. They do this by holding the vertebrae and discs in correct alignment. Strong and flexible belly, hip, and leg muscles also help support your back.

View of the spine from the side



The spinal cord runs through the middle of your spine

- The spinal cord is the nerve center of your body.
 - It runs through the center of your spine.
 - It connects your brain to the rest of your body.
 - It starts at the base of your brain and usually ends at the first or second lumbar vertebrae.
- All along the spine and at the end of the spine are nerve roots.
 - Nerve roots exit and enter the spinal canal on both the left and right sides and the end of the spine.
 - The job of the nerve roots is to carry electrical signals to and from the spinal cord and the muscles, organs, and other parts of your body.



About This Surgery

How does a spinal fusion work?

During a spinal fusion, 2 or more of the bones in your spine are joined or “welded” together. Bones are joined with bones grafts. Your surgeon may also use hardware (medical instrumentation), such as rods and screws to hold the bones in place.

Why bones are fused

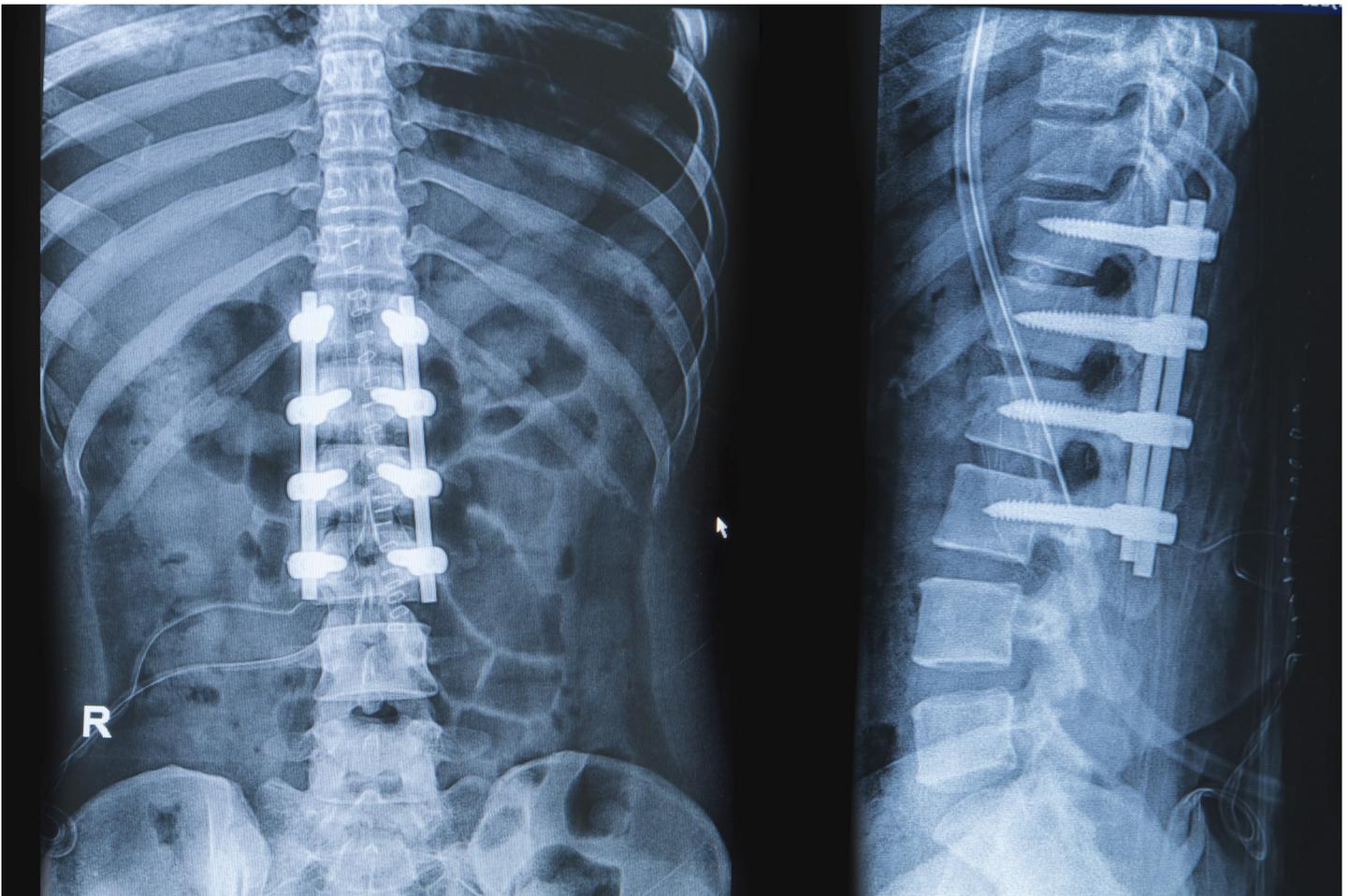
Bones are fused to limit how much they move. This may help lower your pain or fix other

problems you are having. The part of the spine that is fused and how many bones you will have joined depends on your situation.

Parts of the spine that may be fused are:

- vertebrae in the neck (cervical fusion)
- vertebrae in the mid-back (thoracic fusion)
- vertebrae in the lower back (lumbar fusion).

Fusion can be done from the front side of the body or the back side of the body. Your surgeon will decide which is best for you.



How are the bones fused together?

Fusions are made with bones grafts and with or without instrumentation. Your surgeon will remove one or more discs from between your vertebrae. Then your surgeon will replace the disc(s) with bone. This will allow the vertebrae to fuse together as one. You may have a titanium plate and screws placed to hold the bone in place as it fuses.

How do bone grafts work?

To fuse the spine, very small pieces of extra bone are needed. This is called a bone graft. The bone that is attached to the spine acts like a “cement” that fuses the vertebrae together. The fusion stops motion between the two fused vertebrae. After your fusion, you will have a slight loss in flexibility, but you may feel like you can move better after surgery because your problem has been fixed.

Are there different kinds of bone grafts?

There are many different types of bone grafts. Two of the more common types are grafts from a patient’s own body (autograft) and grafts from a bone bank (allograft). There are also artificial bone graft materials that can be used.

Autografts

At Vanderbilt, bone from your own spine will always be used to join your vertebrae together. Your surgeon may also need to use bone from your hip to make the fusion. If bone from your hip is used, your surgeon will take a small amount from the top part of your pelvic bone.

The bone that is used for the graft will be removed during your spinal fusion surgery. You will not need a separate procedure. Your surgeon will talk with you about all of this before surgery.

Allografts

Sometimes bone from people who have died is also used to fuse the vertebrae together. This bone is collected, tested, and stored in bone banks. Bone donors are checked for their cause of death and medical history. Tests are done to check for viruses such as HIV and hepatitis.

The bone is also treated before it is used as a graft. The risk of getting a disease from this type of bone graft is extremely low. Your surgeon will talk with you if they decide to use bone from a donor in addition to your own bone.

Genetically engineered protein (BMP) grafts

A genetically engineered protein (BMP) may also be used create your fusion. The use of BMP will be discussed with you if your surgeon feels this would be helpful in your situation.

How do the bone grafts stay in place?

Spinal fusions with instrumentation

A bone graft takes time to completely grow into the bone and become stable. Most fusions include the use of instruments to hold the bones in place while the graft fuses together. In a cervical fusion, your surgeon attaches a plate and screws in your vertebrae. They are placed in a way that will keep the spine stable while it heals. The plate and screws are generally made of titanium.

Spinal fusions without instrumentation

Sometimes doctors will decide to do cervical spinal fusions without plates and screws. These fusions only use the bone grafts. This means your surgeon will join your bones together by using nothing other than added bone graft material. This might be the case for you if you are having a cervical discectomy and fusion.

What are the benefits of a spinal fusion?

Most people have back surgery to lessen the pain and symptoms caused by back problems. Some have surgery to keep their problems from getting any worse. Benefits of a successful spinal fusion may include:

- less pain in the back and legs
- less weakness or numbness in the legs
- the ability to be more active and have a better quality of life
- improved physical fitness
- increased productivity, including being able to return to work or other activities.

What are the risks of a spinal fusion?

Like any surgery, a spinal fusion has its risks. However, your surgeon would not recommend this procedure for you unless the expected benefits far outweighed the risks.

Risk of bad pain after surgery

Expect to have pain after surgery. This can be a very painful procedure. For a while, every movement you make will send sensation into the muscles in your back. Patients have used words such as “I feel like I’ve been beaten up.”

Often, patients will notice they have pain in areas besides their backs, as well as pain that is new and different than the kind they had before surgery. This pain is probably caused by your body being in an awkward position during surgery. The good news is that this pain will go away. The worst pain typically lasts for 2 to 4 weeks. After that, the rest of your pain will slowly go away. It is possible that you will have some pain that last for as long as 3 to 6 months.

Other minor risks of a spinal fusion

In addition to pain, spine surgery has other minor risks. These are easily treated and will not affect your long-term recovery. We cannot predict every possible thing that may happen.

The most common minor risks are:

- muscle soreness, spasms, and painful pressure areas, especially in the chest
- skin numbness on your back where your incision is
- wound infection on the surface of your skin
- bladder infection
- constipation or difficulty in having a bowel movement
- nerve irritation, such as pain, numbness, and weakness that comes and goes
- pain that is new and different than the kind you had before your surgery
- blood clots in your legs
- spinal fluid leak or a dural tear
- breathing and lung problems
- confusion from anesthesia or pain medicine.

Major risks of a spinal fusion

Major risks of spinal fusion are very rare but include:

- neurologic problems, up to and including paralysis
- blood clots that travel to your lungs (called pulmonary embolism)
- Deep wound infection that requires surgery or IV antibiotics
- failure of the bones to fuse together (called pseudarthrosis) or instrumentation that breaks or pulls out of the bone
- other major medical problems, including stroke, heart attack, and even death.

Risks of anesthesia

The goal of general anesthesia is to make you sleep through your surgery and not feel any pain. General anesthesia is different from regional anesthesia, where only part of your body is numbed and you may be awake.

Risks of general anesthesia include:

- throat discomfort
- injury to teeth or dental work
- harm to the eyes, including blindness
- damage to your vocal cords, which may affect your ability to speak
- headache
- backache
- nerve damage
- being aware during surgery
- allergic reactions
- stroke
- heart attack
- death.

Your anesthesiologist will talk with you in detail about the risks of anesthesia during your pre-surgery appointment.



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*You will have
general anesthesia
during your surgery.*
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Getting Ready for Surgery

There are things you will need to know and do to get ready for your surgery. Let us know if you have any questions or need any help.

Fill out and return all the medical forms we give you

The surgery scheduler will give you forms to fill out. These forms will ask for information about you, your personal and medical history, and your current living situation. Fill them out and return all of these forms to us right away.

Get your teeth cleaned

Get your teeth cleaned before your surgery. You will not be able to have dental work or teeth cleaning for 6 months after surgery.

Get your vaccines

Plan ahead. If you need to get a live-virus vaccine and your surgery is still more than 6 weeks away, you should have your vaccines now. Though you can get a flu shot with an inactivated virus at any time, you cannot get any live-virus vaccines within 6 weeks of your surgery or for 3 months after your surgery.

Go to your pre-anesthesia appointment

You will have an appointment to meet with a member of your anesthesia team before your surgery. They will talk to you about anesthesia and what to expect. They may give you medicine that you will need to take by mouth on the morning of your surgery.

Go to your VPEC appointment

Before your surgery, you will come to Vanderbilt for what is called a VPEC appointment. This is a very important appointment: do not miss it.

At this visit:

- you will bring a list of all the medicines you take, including herbal medicines and those you buy without a prescription
- you will give some blood for testing
- you may give some of your urine for testing
- you will find out what medicines you should not take on the morning of your surgery
- you will talk with an anesthesia nurse practitioner. Be sure to tell this person if you drink alcohol regularly.

Go to any appointments or have tests done if we require them

Before your surgery, you may need to have tests, including a urinalysis, blood work, an EKG, and a chest X-ray. If necessary, all of these tests will be scheduled for you and will be done during pre-testing when you meet with the anesthesia staff.

If it has been some time since you saw your primary provider and you have a lot of medical problems, it would be best that you see your doctor before your pre-test date.

If you smoke, quit now!

DO NOT smoke any time around your surgery—before or after. This includes e-cigarettes, smokeless tobacco, and anything else that has nicotine.

Smoking increases the risk of having medical problems from surgery. Some of these problems include the risk of infection in the instrumentation used in your spine and the risk that your bones and incisions won't heal.

Call us if you get any kind of infection

If you get any kind of infection before your surgery, you need to call the surgery scheduler right away. An infection could move into your spine after surgery and cause serious problems. If you still have infection the day of your surgery, your surgery will need to be cancelled in order to keep you safe and healthy.

Call us if you develop:

- an infection of your teeth
- an infection of your fingernails or toenails
- a bladder infection
- a pimple, cut, scratch, boil, abscess, or insect bite anywhere on your body—especially on the skin over or around the area of your back that will be operated on
- a rash or flaky skin
- a temperature higher than 100.5 F (38.1 C).

Practice the “wake-up” test with a friend or family member

During or after your surgery, you will be asked to do certain movements with your legs, knees, and feet. These movements will allow us to test how well your brain is working. Since you will be affected by anesthesia during or right after your surgery, you need to be familiar with what we will ask you to do. Before your surgery, practice each of the steps below with a partner. Some of these movements are done one leg at a time. Practice with both legs:

- With your partner holding under your foot, push down as if you are stepping on a gas pedal.
- With your partner holding a hand on the top of your foot, push the top of your foot up against their hand.
- Hold your leg straight and raised off the bed. Keep your leg straight and ask your partner to try to bend your knee. Don't let them bend it.
- Have your partner gently push down on your knee with their hand. Try to bend your knee up against them.
- Have your partner hold their hands outside your knees and gently push in. Try to push your knees out against them.
- Have your partner hold their hands inside your knees and gently push out. Try to push your knees in against them.

Things you will hear in the operating room:

- Squeeze my hand.
- Move your feet and toes up and down.
- Point your toes to your nose.
- Push down on the gas pedal.
- Straighten your knees.
- Push out with your knees.
- Push in with your knees.

If your wake-up test is done during your surgery, you should not feel any pain or even remember it.

Exercise to stay strong

The stronger and more fit you are before surgery, the better you will do after. Activities we suggest are walking, swimming and deep breathing exercises. Cardiac and aerobic exercises are also helpful if they are approved by your medical doctor and you are able to do them. You may want to work with a physical therapist or personal trainer to get as strong as you can.

Eat healthy foods to stay strong

Include fruits, vegetables, and whole grains in your diet. A healthy diet will help you have a better recovery.

Make your home safe and easy to move around in

Set up your home now so it will be as easy as possible for you to live in as you recover. Remember, as you recover you will not be able to bend, lift, twist, or stoop down. You will be very limited in your movement after surgery and need to prepare your home for this.

- Make sure you have a cordless phone or cell phone that you can reach easily.
- Cook and freeze meals in advance. Or buy frozen dinners and canned fruits and vegetables. This way, you won't have to worry about doing a lot of cooking.
- Buy heavy or awkward things now before your surgery. This might include dish soaps, detergents, toilet paper, peanut butter, pet food, and heavy jars or cans.
- Store the kitchen items you use the most at counter-top level so they are above your waist and below your shoulders.



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Cook and freeze meals in advance.
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Arrange your home to prevent falls

For the first few weeks after surgery, you will likely need to use a walker or cane (or both). Move your furniture so you have a clear path and will be able to use your walker or cane wherever you need to go.

- Pick up all clutter off the floor so you don't trip or hurt yourself.
- Remove any area rugs in your home so you won't trip over them.
- Tape down all electrical cords so you don't trip over them.
- Put shower grab bars in the shower, and put rubber mats in the bathtub and shower. More falls happen in the bathroom than any other room in the house.
- Consider installing handrails on stairs in or outside of your house before your surgery.
- If your bedroom is on an upper-level floor, think about setting up a bed on the first floor of your home to use as you recover.
- Keep the items you use often within easy reach.
- Get a rolling cart to help you move items without having to carry them.
- If you have pets, make arrangements to get help feeding and taking care of them since your movement will be so limited.

Arrange for a caregiver

It is important that you have one or more caregivers to help you as you recover. Now is the time to ask family, friends, or others you know if they can help you once you leave the hospital. You will need help with housework, errands, and driving. Remember that you will not be able to drive for 6 weeks after surgery. You also will not be able to drive for as long as you are taking your prescription pain medicines.

After surgery, you will need help with:

- getting to and from the hospital, physical therapy, and doctor appointments
- going to the bathroom and showering
- grocery shopping and meals
- keeping the house clean and safe for you to walk in
- caring for small children and pets.

For the first 2 weeks after surgery, it is best if someone can stay with you at night.

Fourteen days before surgery

Stop drinking any beer, wine, liquor, and all other alcohol drinks.

Seven days before surgery

Stop taking the medicines listed here. Taking the wrong medicine too close to surgery can keep you from having your surgery. It could also cause complications.

Important: If one of your doctors thinks it is not safe for you to stop any of these medicines, you must talk to the surgeon!

Seven days before surgery, stop taking these prescription medicines:

- blood thinners, such as Coumadin and Persantine
- all anti-inflammatory prescriptions, such as Clinoril, Indocin, Daypro, Celebrex, and Vioxx.

If you take insulin or prednisone you may have to adjust your medicines before surgery. Make sure to tell your surgeon about all the medicines you are currently taking.

Seven days before surgery, stop taking these over-the-counter medicines:

- aspirin
- ibuprofen
- Advil
- Motrin
- Aleve
- Naprosyn (naproxen)
- any other medicines that contain aspirin, ibuprofen, or other non-steroidal anti-inflammatory drugs (called NSAIDs) that you can buy with or without a prescription.

Seven days before surgery, stop taking these herbals and supplements:

- chondroitin
- danshen
- feverfew
- fish oil
- garlic tablets
- ginger tablets
- ginko
- ginseng
- quilinggao
- vitamin E
- Co Q10.

Three days before surgery

- Get everything ready to go to the hospital. Plan to bring only a few clothes and the personal care items you need, including:
 - a short, lightweight robe
 - loose fitting clothes with elastic waistbands that you can easily put on when you get ready to leave the hospital
 - t-shirts
 - shoes or slippers with a closed back and non-skid soles
 - eyeglasses, if you need them
 - a hairbrush, if you need it.
- Do not pack any valuables. They should be left at home.
- Bring a list of all the medicines you currently take. You don't need to pack any of your medicines. Just bring the list.

The day before surgery

The day before surgery, a surgery scheduler will call you to make sure you know what time to come to the hospital.

Please give them a choice of phone numbers to call in case the hospital needs to speak with you.

The night before surgery

- Remove any nail polish from your fingers and toes.
- Clean your skin to prevent infection:
 - Take a bath or shower.
 - Wait 1 hour. (As you wait, read the instructions that came with the chlorhexidine gluconate antiseptic wipes that we have given you.)
 - After 1 hour, wipe your body with the antiseptic wipes. Follow the instructions exactly. Do not let the wipes touch your eyes, ears, mouth, or genitals. Wipe around the area to be operated on last.
 - Let the antiseptic dry on your body. Do not rinse it off.
- Do not use lotions, moisturizers, powders, or makeup on your body or face after your shower or before you go to bed.

Eating and drinking before surgery

We used to tell you not to eat or drink anything after midnight before your surgery. We have changed this. This change may help you not only feel better but also have better results.

- Most people can have a light snack up to 6 hours before surgery. A light snack can include:
 - toast without butter or margarine
 - a piece of fruit
 - crackers, such as saltines or graham crackers.

- A light snack does NOT include fried or fatty foods, or meat. You will need to allow at least 8 hours to digest your food if you eat fried or fatty foods such as biscuits, toast with butter or margarine, hash browns, eggs, or pancakes, or if you eat any type of meat.
- If you have a problem swallowing or digesting, such as GERD, acid reflux, or heartburn, you may need to allow more time for your food to digest. Talk with your doctor about this.
- You may chew gum or suck on hard candy any time before your surgery.
- Most people can have clear liquids up to 2 hours before surgery. Clear liquids include:
 - water
 - fruit juice without pulp (apple juice and grape juice are clear liquids; orange juice is not)
 - carbonated drinks
 - tea or coffee (no milk or cream)
 - a popsicle
 - sports drinks.

The day of surgery

- If you shower or bathe the morning of your surgery, do not use any lotions, moisturizers, powders, or makeup to your body or face after you wash.
- You may brush your teeth.
- You may take your morning pills. Pills you may take include medicines for your heart, blood pressure, or breathing, as well as any medicines you may have been given at your pre-anesthesia appointment.
- Before you leave for the hospital, follow the instructions and wipe your body again with the antiseptic wipes. Fill out the form that came with the wipes. Bring this form with you to the hospital. The form will become part of your medical record.

At the Hospital

Go to the admission desk when you arrive

Check in at the hospital 2 hours before your scheduled surgery time. Go straight to the patient admission desk in the main lobby on the first floor of the hospital.

Remember: The time your surgery begins may change. Sometimes your surgery can start a few hours later than the scheduled time. Much depends on when the last surgery finishes. Thank you for understanding.

Leave these things at home

- Do not bring your cane, crutches, or walker when you first come to the hospital. (Have your cane, crutches, or walker brought to you the last day of your hospital stay when you will need a walking aide for your trip home.)
- Do not bring large amounts of money or valuable items, such as jewelry.

After you check in, we will take you to the Holding Room

- One friend or family member can come with you.
- You will change into a hospital gown. You will give your clothes and anything else, like dentures, glasses or contact lenses, hairpins, or jewelry, to your support person to take care of while you are in surgery.
- We will put an IV into your arm. An IV is a tube that goes through your skin and puts medicine directly into your body.
- You will meet with your anesthesia team. They will talk with you about your medical history. They may start managing your pain by giving you some pills to take by mouth.
- We will take you to the operating room on a stretcher.

.....
*If you feel anxious or
tense at any time,
tell your nurse.*
.....



Surgery

- From the Holding Room, we will take you to the operating room. The staff members who are working with your surgeon and the anesthesiologists will prepare you for your surgery. You probably will not see your surgeon at this time. You will be given general anesthesia. Once you are asleep and about 30 to 60 minutes after you go to the operating room, your surgery will begin.
- When your surgery is finished, it usually takes 30 to 60 minutes to wake you up and put you on the hospital bed before you are taken out of the operating room.
- After surgery, the surgeon will speak with your family.

What happens during surgery

Anesthesia

Anesthesia is medicine that we will use before and during surgery to keep you from having pain during surgery. It will also relax you and make you sleep.

The procedure

Your surgeon will make a vertical cut along the back of your spine. The length of this incision will depend on how many bones are being fused together. Your surgeon will then do the spine fusion with or without instrumentation. When the bone graft is in place, your incision will be closed and the surgery will be complete.

Spinal cord monitoring

Spinal cord monitoring is a procedure that may be done by a nurse during your surgery. Electrodes are placed on your scalp and other parts of your body to make sure that the spinal nerves have good blood flow. If you have spinal cord monitoring, you may or may not notice some irritation to your scalp after the surgery. This irritation should go away within a few days after the surgery.

In case of excess blood loss

All surgeries will cause some bleeding. However, it is highly unlikely that you will need any blood during your surgery. It is rare that a patient may need blood transfusions either during or after cervical fusion surgery. We will talk with you about this before surgery. If you are against getting blood products, please let us know.

Intraoperative traction

Your surgeon may decide to use a traction device to hold your head up during surgery. This would be used to lower the pressure on your face since too much pressure on the face can lead to complications. You will not wake up in traction, but you will notice small sores on either side of your head where the traction was placed. These sores will heal quickly.

We will do your wake-up test during or right after your surgery

The wake-up test will allow us to test your brain function during or right after surgery. The tests involves you making the movements that you practiced before surgery. Go to page 10 in the “Before Surgery” section of this document to read more.

We will manage your pain before, during, and after surgery

Pain is a common part of spine surgery and you should expect it. But know that we will help you manage your pain. Our goal is to do everything we can to help lower your pain, while managing the side effects of your pain medicine. We want you to be able to get up, move around, and function well enough that you are able to recover as quickly as possible.

A multimodal pain approach

The approach we will use to treat your pain is what we call a “multimodal” approach. This means we will treat your pain in multiple ways:

- We will give you different types of pain medicines.
- We will give you pain medicines at different times, including before, during, and after your surgery.

Pain management before surgery

In the Holding Room, we may give you a few pills to help stop some of your pain before it even starts. The types of pills and the amount of pills that we give you will depend on your personal history. Your history includes any other medical conditions you have, any medicines you regularly take, and your age. The exact medicines you get will be decided by your surgical and anesthesia teams before your surgery.

Pain management during surgery

While you sleep during surgery, the anesthesia team will give you more medicines through your IV. This medicine will help lower the overall pain you have after surgery, as well as the pain and nausea you have immediately after the procedure.

Pain management after surgery

After surgery, we will continue to give you more medicine for your pain. Like before, the specific medicines we give you will depend on your medical history and the medicines you already take. In general, the medicines you get will usually include a pain medicine, a medicine to lower inflammation and swelling, and a medicine to lower nerve pain.

In most cases, we will give you prescriptions for these medicines when you leave the hospital, and you will take these medicines for several weeks.

After surgery, we will take you to the Recovery Room or the Intensive Care Unit

Most of the time, patients are taken to the Recovery Room right after surgery. But sometimes, after major reconstructions, patients will go to the Intensive Care Unit (ICU) for 1 or 2 days.

You may go to the ICU after surgery if:

- you had major reconstruction on your back.
- the anesthesiologist decides that your breathing tube should be kept in place after your surgery.

The Recovery Room

In the Recovery Room, we closely watch over you as you wake up after surgery. After you are awake, we will take you to your regular hospital room on the Orthopaedic Floor.

- When you wake up:
 - a nurse will help you breathe deeply and have you cough to clear your lungs
 - you will do ankle pumps to lower the risk of blood clots
 - you will have an IV in your arm so we can give you medicine as needed
 - you may get oxygen to help you breathe.
- Most people stay in the Recovery Room for several hours after surgery. How long you are there depends on how your body reacts to the anesthesia.
- If the nurse feels you are up to it, you may be allowed to have visitors once you are awake and your pain is under control.

We will give you pain medicine after surgery

We will do everything we can to lessen your pain after surgery. But some pain is simply a part of recovery. Our goal is to make you as comfortable as possible while keeping the side effects of any pain medicine you get as low as possible.

To control your pain after surgery, we will give you:

- pain medicine through your IV
- pills, including pain pills and anti-inflammatory drugs.

Other medicines you will need after surgery

In addition to pain medicine, you may get medicines to stop nausea, if you need them. Sometimes patients also get blood thinners to help keep blood clots from forming.

During your hospital stay you will also have a list of “as needed medicines” that will always be available to you. These medicines are for symptoms such as muscle spasms, nausea, indigestion, pain, and itching. If you have any symptoms that are not being controlled, please talk with your nurse.

After the Recovery Room, we will take you to a regular hospital room

Once you are ready, we will take you to your regular hospital room. You will still have your IV in so we can continue to give you medicines.

What to expect after surgery

You may have facial and body swelling

It is common for patients to have facial and body swelling after surgery. This is caused by the position your body was in during surgery and IV fluids. All of this swelling usually goes away in 1 to 2 days. It is nothing to worry about. Patients may also have a swollen tongue for the first few days after surgery, but this is rare.

You may have a cardiac monitor

You may have a cardiac monitor attached to your body so we can watch your heart rate and rhythm.

You may be wearing an oxygen mask

You may have an oxygen mask on to help your breathing.

You will have TED hose or plastic wraps around your legs

You will be wearing elastic, thigh-high stockings (TED hose) or inflatable plastic wraps (sequential pumps) on your legs. Both the TED hose and sequential pumps are used to help prevent blood clots.

You will have a Foley catheter

You will have a Foley catheter in your bladder. This is a tube that is placed into the bladder to drain urine from your body. The catheter will be put into your body after you are asleep in surgery. The Foley catheter will be removed once you are able to get out of bed fairly easily.

You will have drains (Hemovacs) attached to your body

You will have one or more drains (called Hemovacs) near your back, front, or side incision(s). These drains collect excess blood and drainage from under the skin. This keeps your wounds from swelling and also helps the doctors estimate your blood loss.

At first, you will get water and ice chips instead of regular food or drink

After surgery, you are likely to get sick if you eat regular food right away. Your body has to gradually work up to digesting a regular diet. At first, we will give you ice chips and sips of water. Next, we will give you a clear, liquid diet. Finally, when you are ready, you will go back to eating your regular diet.

You will have breathing exercises to do

After surgery, you will need to do breathing exercises to keep your lungs clear. You will do these exercises using a device called an incentive spirometer. We will teach you how to use it.

There is a little ball in the device that rises up with the force of your breath. The higher the ball, the better your lungs are working. Challenge yourself to keep getting the ball to a higher number.

We will work with you and your family to remind you to use your incentive spirometer often while you are in the hospital.

Getting out of bed

On the first day after your surgery, we will help you get up and sit on the side of your bed. We will also help you get out of bed to either stand or sit in a chair. It is very important that you begin walking as soon as possible. Walking will help you get better faster.

Numbness and tingling

It is very common for patients to have numbness around their incisions after surgery. This is expected with any skin incision. The area of numbness gradually shrinks with time but may take up to 1 to 2 years to go away. Some patients also say that their feet, legs, or back “feel funny.” It is common to have tingling feelings and sensations that can’t be explained. If you have any of this, do not worry. These will mostly likely go away over time. It is still safe for you to move and walk.



Use your spirometer after surgery to help keep your lungs clear.

Staying safe while you are in the hospital

Prevent falls

When you need to get up or go to the bathroom, always ask for help from your nurse or another staff member. It is very important to stay safe and avoid falls while you are in the hospital.

Prevent blood clots

You will get TED hose or plastic sleeves to wear around your legs to help keep blood clots from forming. Some patients also get blood thinning medicines. Every day while you are in the hospital, we will send a sample of your blood to the lab to make sure your blood is not too thin or too thick.

Keep your lungs clear

You will keep doing your breathing exercises and using your incentive spirometer. Exercising your lungs will help prevent pneumonia, which is a risk after surgery.

The length of your hospital stay

How long you will be in the hospital after surgery will depend on how well you are able to walk around and how much pain you have. Most patients leave after 2 nights (though some patients are able to leave the hospital the day after surgery). But if you have any other medical issues that slow your recovery, you may need to stay longer. Your surgical team will decide exactly how long you need to stay.

Visitors

You are allowed to have visitors while you are in the hospital. You may even have 1 person who is 18 or older stay with you at night. Each room has a pull-out bed.

Getting you ready to leave

A nurse case manager or social worker will probably visit you while you are in the hospital. They are members of your healthcare team. They can help you make plans for the things you will need to do after you leave the hospital. This may include arrangements for outpatient therapy and lab work, home health services, and other rehab programs or services. You can ask to speak with the case manager or social worker at any time during your hospital stay.

Make sure you have a ride home

You must have someone pick you up at the time you are released from the hospital. You will not be allowed to drive yourself home or leave the hospital alone.

Am I allowed to take a taxi or a bus home?

No. You must have someone pick you up.

After the Hospital: Your Recovery

Caring for your incision

Bandages

Most patients leave with glue or steri-strips (small tape strips) on their incision(s).

- Check your incision daily for any problems.
- Do not put any ointments or solutions over your incision or steri-strips at any time.
- Let the steri-strips fall off on their own. (The only exception is if they are still there 2 weeks after your surgery, then you may have someone remove them at that time.)

Showering, bathing, and swimming after surgery

- Do not get your incision wet for the first 4 days after your surgery. Cover your incision when you shower.
 - We will give you 4 aquaguards when you leave the hospital; you will use these to cover your incision when you shower.
 - Put one on before you get in the shower. Then take it off and throw it away after you get out of the shower.
- On the 5th day after your surgery, it is safe to get your incision wet when you are in the shower. You no longer have to cover it.
- On the 5th day after your surgery, clean your incision using soap and water when you are in the shower. Then gently pat your incision dry with a towel.
- No tub baths for 4 weeks after surgery.

- No swimming in pools, hot tubs, lakes, rivers, or the ocean for 4 weeks after surgery.
- It is OK for you to bathe and swim in the 5th week after surgery as long as your incision is closed and healing well.

Raising your arms overhead when you shower or brush your hair

It is OK for you to raise your arms over your head to wash and brush your hair.

Fighting infection

- Always wash your hands before and after you touch your incision.
- Call us at (615) 875-5100 if your incision:
 - gets redder
 - swells
 - feels warm or begins to hurt
 - begins to drain or smell bad
 - separates at the edges.
- Also call us if:
 - you are unable to swallow
 - you have a temperature higher than 101.5 F (38.6 C).

Pain

- When you left the hospital, we probably gave you a prescription for pain medicine. While you may need prescription pain medicine at first, it is best to start lowering how much you take as soon as you can.
- If you were taking medicine(s) before surgery, do not take those with any new prescriptions you get from the surgeon.

Understand your prescription pain medicine

- Take your pain medicine exactly the way your doctor tells you.
- Pain medicine can make you constipated. Drink plenty of water and eat more fiber (found in foods like fruits, vegetables, and whole grains) to help you stay regular.
- If you are going to need a refill of your pain medicine, call our office at least 7 days before your current prescription runs out. Sometimes you may have to wait 24 hours for a refill. We can't give refills at night or on weekends.
- Things to remember:
 - You cannot call in to the pharmacy for a refill prescription. You must call our office.
 - You can either pick your prescription in person or ask us to mail it to you at your home address.

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*It is normal to have
pain after surgery.*
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Expect to take less pain medicine over time

Prescription pain medicine is addictive; it is important that you do not become dependent on it. We will expect you to use less of it over time.

- When you first leave the hospital, we will give you a prescription for pain medicine with specific instructions.
- We recommended that you lower your use of pain medicine slowly. If you are taking 2 tablets every 4 hours as needed, then take 1 tablet every 4 hours, then 1 tablet every 5 hours, and so on until you are able to stop taking them all together. You may be given specific instructions on how to do this when you are discharged.
- Six weeks after surgery, you should no longer be taking any prescription pain medicine.

Important: Six weeks after your surgery, we will stop refilling prescriptions for pain medicine. If you think you still need prescription pain medicine after 6 weeks, we will refer you to your regular doctor. There are no exceptions.



Do not take too much acetaminophen

Severe liver damage may occur if you take more than 4,000 mg of acetaminophen (Tylenol) in a 24-hour period. If you take acetaminophen (Tylenol), take it alone. Do not take it with any prescription pain medicine.

- There are more than 600 over-the-counter and prescription medicines have acetaminophen in them. Some patients go over the recommended dose either by accidentally taking multiple acetaminophen-containing products without realizing it, or by not following dosing instructions.
- Medicines such as Percocet, Vicodin and Norco have acetaminophen in them—from 325 mg to 500 mg per tablet. It is very important that you know the dosage and that you do not combine it with other products containing acetaminophen.

For 6 months after surgery, do not take any NSAIDs

Do not use any NSAIDs, such as Ibuprofen, Motrin, Advil, Aleve, Celebrex, etc., for at least 6 months after surgery. These medicines will actually slow the fusion healing process.

Once you no longer need your prescription pain medicine, we recommend you take acetaminophen (Tylenol) when you have pain.

If you were taking a prescription bone medicine before surgery

Your surgeon will tell you when it is OK for you to start taking these medicines again. Do not start taking any bone medicine—including Forteo, Fosamax, and Reclast—until you talk with your surgeon.

If you are constipated after surgery, follow these bowel medicine guidelines

When you are discharged from the hospital, we may give you a prescription (Senna-S) for a stool softener and laxative medicine. Follow these guidelines if you have problems going to the bathroom:

- If it has been 3 days since your last bowel movement, increase the Senna-S to 2 tablets twice a day, which is the most you can take at one time.
- If you do not have a bowel movement for 5 days, take Miralax as directed in addition to the Senna-S.
- If you have not had a bowel movement for 6 days, take a suppository as directed on packaging.
- If you have not had a bowel movement for 7 days after surgery, use a Fleets enema. Follow the directions on the package. If you are still constipated, please call our office.
- If you become nauseated, have vomiting, your belly is swollen and hard, or you have very bad belly cramping at any time, contact our office immediately.

Protect your back as you recover

Bending and lifting

During the first 6 weeks, don't bend or lift anything over 15 pounds. When you lift something, keep it close to your body so that your leg and arm muscles do the work. Remember to brace your belly muscles. Stoop at your hips and bend your knees. Keeping your back straight and the three curves of your spine balanced. This will help prevent pain and further injury to your spine.

Walking exercise

Walking is excellent exercise. Walk as much as you can over the next 6 weeks while you are recovering. Walking will:

- help your bones fuse by increasing the flow of blood to the area that was fused
- benefit your lungs, heart, circulation, and digestion
- help keep blood clots from forming
- increase your muscle strength and endurance.

Toileting

Low toilet seats can make it hard to go to the bathroom after surgery. Depending on the type, location, and surrounding area of your toilet at home, we may tell you to use a raised toilet seat or toilet rails while you recover.

We will talk with you which type of seat and rails are easiest and safest for you to install at home. (Installation requires no permanent changes in your home or bathroom fixtures.)

You may have difficulty reaching back to clean after toileting. The therapist may also show you different techniques or adaptive equipment to assist with this task.

Walking, dressing, and bathing

Members of the physical therapy and occupational therapy teams will work with you in the hospital so you will know how to safely walk, resume activities, bathe, dress, and take care of yourself as you recover.

- A physical therapist will work with you so you know how to safely move around and stay active.
- An occupational therapist will help you learn how to safely do activities like bathing and dressing while you recover.
- Because of your loss in flexibility and the mobility restrictions, consider these tips:
 - Dress sitting in a supportive chair using adaptive equipment to reach your legs.
 - Wear loose-fitting clothes and slip-on shoes for the first several weeks.
- To help you dress, we may provide you with some of these tool:
 - a long-handled reacher
 - a long- handled sponge
 - elastic shoe laces
 - a sock donner
 - a long-handled shoe horn.

Adaptive equipment

Patients sometimes need adaptive equipment (a wheeled walker, an elevated toilet seat) after surgery. Hospital beds are generally not needed

when a person goes home after a spinal surgery. You will be able to sleep in your regular bed as long as it is not too low to the ground or a water bed. Your occupational and physical therapist will see you during your hospitalization and help you get any equipment you will need at home.

Turning safely in bed

- Tighten your stomach muscles and bend your knees slightly toward your chest.
- Roll to one side, keeping your ears, shoulders and hips in line. Be careful not to bend or twist at the waist.

Getting out of bed safely

- Tighten your stomach muscles and turn onto your side.
- Push your body up with one elbow and the other hand. At the same time, gently lower both legs to the floor. Keep your stomach muscles tight.

Protect your back while getting up and sitting down

- Use your arms to lift up and get down.
- Keep your ears, shoulders, and hips in line, brace your stomach muscles, bend at the hips keeping your back straight
- Use your leg muscles to lower and raise yourself onto the front edge of the chair or couch.

Standing for a long time

- Change your position often by shifting your weight from one foot to the other

- Don't twist or turn from the waist. Instead, turn your entire body as a single unit.

Going up and down stairs

- Use handrails if you can, and climb just one step at a time. Remember to be careful and take your time.
- Your physical therapist will practice going up and down stairs with you while you are at the hospital.

Protect your back when you ride in a car

Driving

No driving 6 weeks after your surgery and for as long as you are on prescription pain medicine.

Riding as a passenger

You may ride in a car as a passenger whenever you feel you can tolerate this. Some tips:

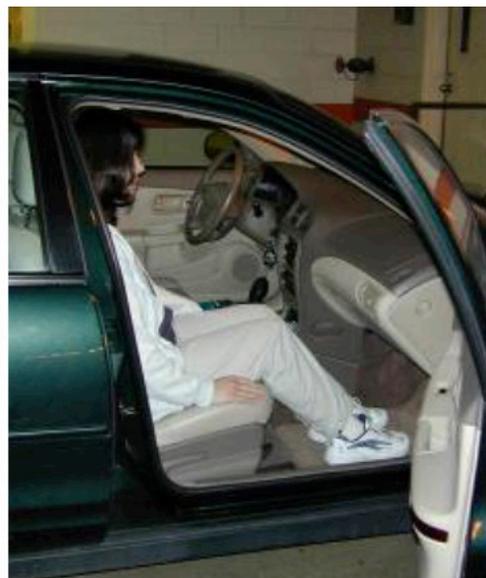
- You should sit in the front passenger seat, with the seat adjusted to a normal seated position.
- You should probably start with shorter drives. If you do take a longer trip, stop every hour and walk around.
- As you are recovering, you should only ride in cars that are mid-size or larger.
- Avoid all compact cars (2 doors), all sports cars, and cars with bucket seats. It is hard to sit down so low.

Getting in and out of the car

- To enter the car, walk up to the passenger door, turn, and then back up until you feel the car behind your legs. Reach back and place your left hand on the dashboard or car door and place your right hand on the back of the front seat. Bend your legs and gently sit down. Scoot your hips back and slowly turn your body as you put your legs inside the car.
- To exit the car, gently turn your body toward the door while placing your legs outside the car. Scoot forward until your feet are on the ground. Then push up to a standing position by placing your arms on the dashboard or car door and back of the seat.
- A plastic trash bag or satin pillowcase on the car seat is helpful for sliding and turning.

Stop and take breaks if you are in the car for a long period of time

When you are in a car, we recommend that you stop every hour to get out and walk. This is especially important when you leave the hospital if your home is far away. Walking and moving will help keep blood clots from forming.



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Take care while getting in and out of a car.
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More tips for staying safe as you recover

Be sure to explain to your entire family what you must do to be safe.

- Always keep a cell phone or cordless phone with you in case you are alone and need help.
- Use a walker basket or shopping bag so you can carry items with you when you use your walker.
- Keep a night light on in hallways and in the bathroom.
- Allow yourself extra time when you get up from sitting or lying down. It will help keep you from getting dizzy.
- Don't walk outside in icy or snowy conditions.

Sexual activity

It is safe for you to have sex when you feel comfortable and it doesn't cause you pain. Avoid twisting and bending at the waist while you are healing. The safest position is lying flat on your back in bed.

Returning to work

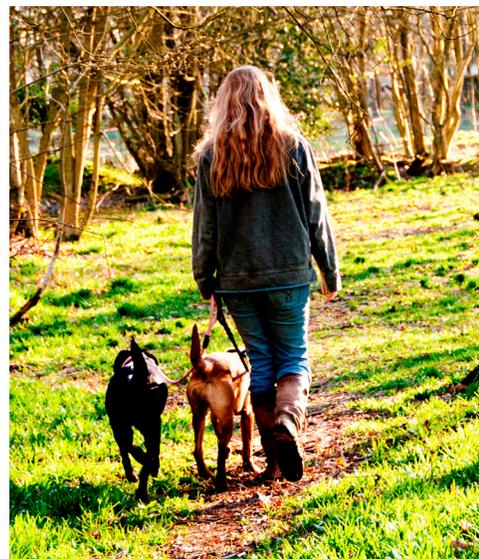
Most patients are able to go back to desk work by 6 weeks after their surgery. All of this depends on your progress and the type of surgery you had. We recommend that when you do go back, you go back to half days for the first couple of weeks.

Preventing setbacks

As you recover, be careful and increase your activity slowly. If you have increased pain for more than two hours after an activity, it usually means you've done too much too soon. Don't just reach for the pain pills. Take pain as a warning sign to slow down and pay attention to your posture and movements. Make sure you're bracing your belly muscles and keeping your ears, shoulders and hips in line.

Staying safe if you have pets

If you have pets, you will probably need help taking care of them after surgery. You will not be able to lift heavy bags of pet food or bend down to the floor to fill their dishes. You will not be able to walk your dog using a leash if it is a large dog that pulls. Also, it is very easy to trip over pets, and you will need to be careful since pets may jump. Please make arrangements for assistance with pet care after your surgery.



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Be careful using a leash.
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Guidelines for going back to your regular activities and exercises

On this page is a general time schedule of when you can go back to doing activities you like to do. Everyone is different, so there may be some exceptions. What you can do will also depend on your specific surgery.

Two weeks after surgery:

Two weeks after surgery, it is safe for you to lift up to 15 pounds.



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Walking is great exercise and helps your body heal faster and get stronger.
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Six weeks after surgery, you can:

- drive, if you are not taking any prescription pain medicine
- do desk work
- do light arm exercises
- ride a recumbent exercise bike (this is the kind of bike that has a chair in which you sit and can lean back while you peddle)
- swim, as long as you do not dive.

Three months after surgery, you can:

- shoot free throws
- play gentle tennis
- putt with your golf club.

Six months after surgery, you can:

- play non-competitive sports
- lift more than 20 pounds
- jog lightly on an flat surface
- bend forward from your hips
- take a full swing with your golf club.

1 year after surgery, you can:

- play competitive sports
- ice skate
- roller skate
- snow ski
- water ski
- bowl
- ride horses, as long as there is no jumping.

Six Weeks After Surgery: What to Expect

Keep your 6-week follow-up appointment

Six weeks after your surgery, you will need to come to our office for a follow-up appointment. If no appointment has been scheduled for you within a few days after your surgery, please call us at (615) 875-5100 to set up an appointment.

Remember that you are still healing

Bone takes 4 to 8 months to fully fuse and heal. Until that time, you may still have some aches and pains in your back. All of this is normal during the healing process.

Around 4 to 8 months after the fusion, you may notice a sudden decrease in your pain. This is the day that the bones all fused together and became solid. Patients have often described it as a light switch going off. You can help yourself heal faster by doing these things:

- During the first few weeks, get up and walk 3 to 4 times a day. Increase the amount of time you walk each week. Getting up and moving will help feed the growing bone with oxygenated blood.
- Avoid extreme motion in your back. The less you stress it, the faster it heals.
- Don't take ibuprofen, Aleve, aspirin or any other anti-inflammatories, as they all slow down bone healing. You may take acetaminophen (Tylenol) products for pain.
- Don't smoke or use any tobacco products.

If you had arm weakness before surgery

If you had weakness in your arms before the surgery, you can start doing weight lifting 6 weeks after your surgery.

If you had numbness before surgery

If you had numbness for more than 3 weeks before your surgery, it is possible that you still have not noticed an improvement.

- It often takes weeks to months for numbness to get better, especially if you had constant numbness for a long time before surgery.
- Until the 1-year mark, we won't be able to tell if the numbness is permanent.

Common Questions

How long should I avoid driving?

- Do not drive while taking pain medicines.
- Avoid driving during the busy traffic times.
- Some states do not allow collars when driving. You should wear your collar when driving, so if your state does not allow you to drive with a collar, then do not drive for the first 6 weeks after surgery.

How soon is it safe for me to have sex after surgery?

You can have sex as soon as you feel comfortable doing so. The safest position is for you to lie flat in bed.

When can I lift weights?

Avoid all overhead lifting. You can lift light weights that are 15 pounds or less. Hold the weights close to your body when you lift. And keep the neck in a neutral position while lifting.

Will the instruments used in my fusion cause alarms in airports to go off?

No. The materials used in your fusion are made of titanium. You will not trigger any alarms or metal detectors.



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*Remember to carefully
position your mirrors
before starting to drive.*
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