

# Posterior Cervical Fusion Surgery

*A guide for patients and their caregivers*



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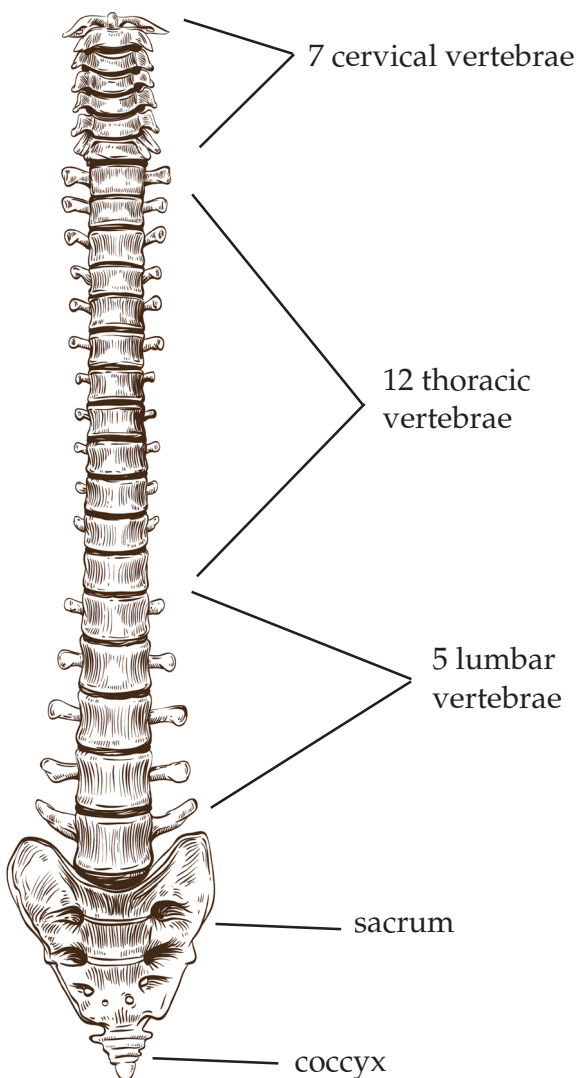
# About the Spine

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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).

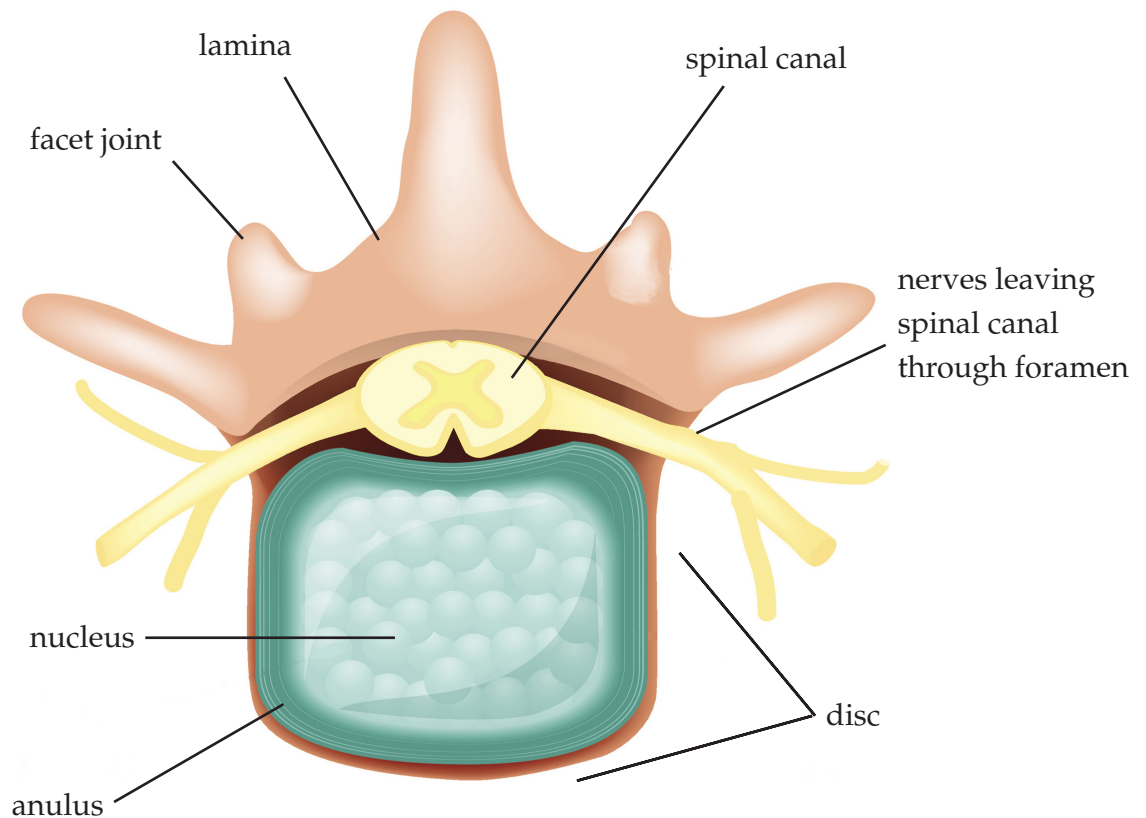
## There are discs between most of the bones in the spine

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 gives 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

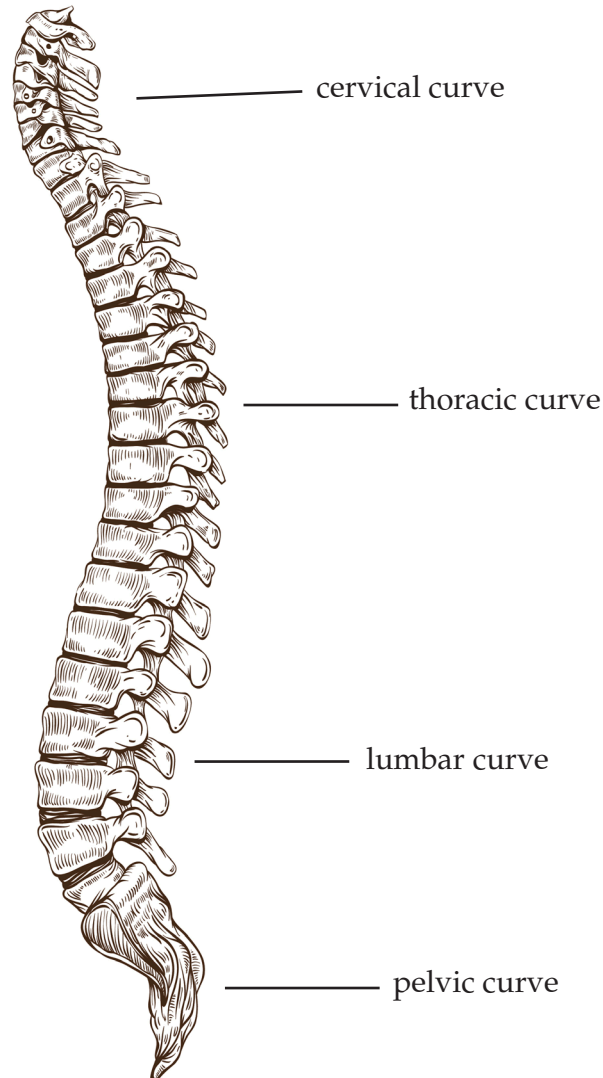
A healthy spine with proper alignment has 3 natural curves: cervical, thoracic, and lumbar.

- 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.

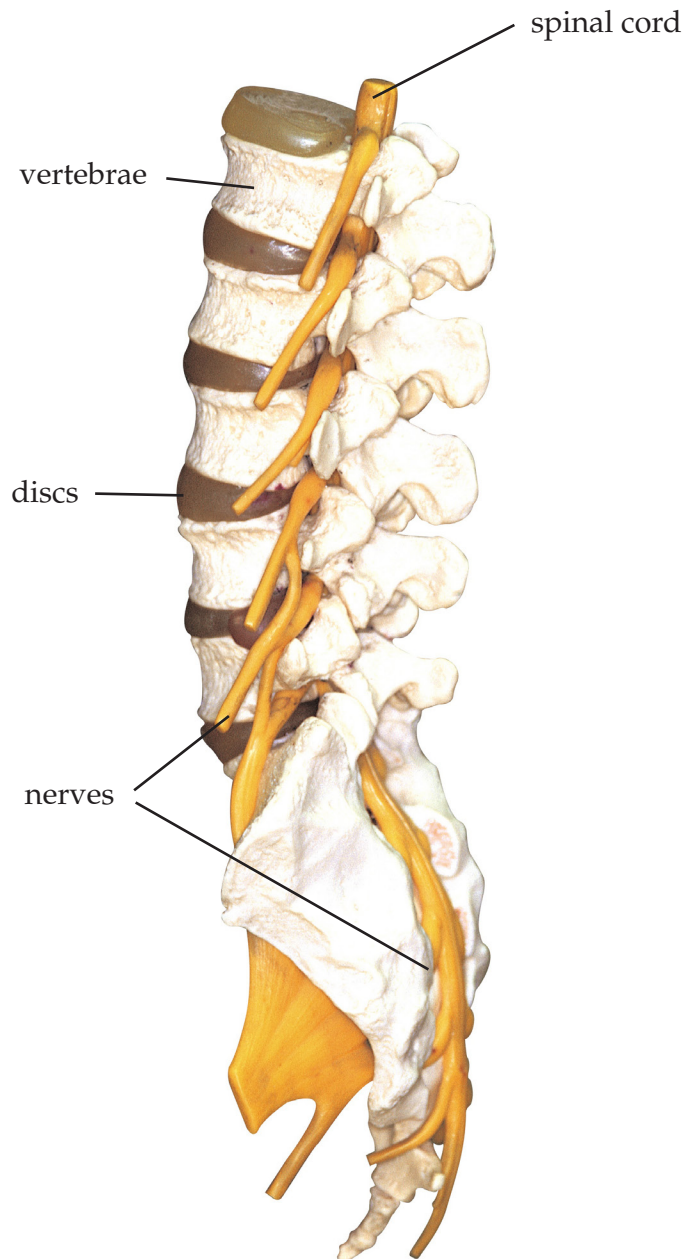
### View of the spine from the side





## 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

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## What is posterior cervical fusion surgery?

- A spinal fusion is when 2 or more of the bones in the spine are joined or “welded” together.
- Cervical refers to the neck area of your spine.
- Posterior means the surgery is done on the back of your spine.

### *Why bones are fused*

Joining the bones together will limit how much they move. This may help lower your pain or fix other problems you are having. The number of bones you will have joined together depends on the problems you have. During your fusion, you may also have a spinal decompression procedure.

### *Posterior cervical foraminotomy*

This involves opening the foramen to relieve the pressure on the nerves.

### *Posterior cervical laminectomy*

In this procedure, your surgeon will remove the lamina in one or more places from your spine. This will remove pressure on the nerves.

### *Posterior cervical laminoplasty*

This involves opening of the lamina to remove the pressure on the nerves.

## How are the bones fused together?

Fusions are made with bone 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’ll 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 to 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're 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're having a cervical discectomy and fusion.



## Why do I need spinal fusion surgery?

Your surgeon thinks that the problems and symptoms you have may be caused by compression or squeezing of the nerves or nerve roots in the cervical area of your spine.

Spinal fusion surgery is recommended to help improve these symptoms and to keep these symptoms from getting worse.

Symptoms that may be improved with this surgery are:

- headaches in the back of your head
- pain in your neck, shoulders, upper back, arms, or fingers, as well as occasional or frequent numbness, tingling, and weakness
- more serious problems, such as the loss of balance and problems with coordination and dexterity.

## *What causes spinal nerves to be compressed or squeezed?*

- **Degenerative disc disease:** A disc in the spine ages and loses its ability to cushion the vertebrae. The disc loses its elasticity, which can cause the disc to crack, flatten, or even turn into bone. As the disc flattens, the vertebrae on either side of the disc rub together. This can cause bone spurs, which can cause pressure on the nerves.
- **Herniated disc:** The outer part of a disc (the annulus) tears. The tear allows the soft watery material inside of the disc to come out. The disc herniation can then cause pressure on the spinal nerves or the spinal cord, which can lead to pain and other problems.

- **Bulging disc:** The soft, inner part of the disc stays inside the annulus, but it is no longer in the right place. A bulging disc can cause pressure on the spinal nerves or the spinal cord, which can cause pain and other symptoms.
- **Spinal stenosis:** Bone spurs grow into the space through which the nerve roots exit the spinal canal and make it smaller. This can cause pain and other symptoms.
- **Spondylosis:** Degenerative arthritis of the spine. This type of arthritis can cause pressure on spinal nerve roots, which can cause pain and other symptoms.
- **Radiculopathy:** Pressure on the root of the spinal nerves, which can cause pain and other symptoms.
- **Myelopathy:** Pressure or compression on the spinal cord, which can cause numbness, weakness, tingling, and other symptoms.
- **Pseudoarthrosis:** Bone does not fuse together.

## What are the possible benefits of this surgery?

Most people who have back surgery do so to lessen the pain and symptoms that are caused by their back problems. Some benefits of a successful spinal fusion may include:

- fewer headaches
- less pain
- less weakness and numbness
- the ability to be more active and gain a better quality of life
- improved physical fitness
- better mood because you have less pain
- increased productivity, including being able to return to work or other activities.

## What are the risks of this surgery?

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.

### *Risks of surgery*

- **Scarring:** You'll have a scar from the incision that is made during your surgery. The incision will be vertical along your cervical spine; its length will depend on how many levels of the cervical spine need to be corrected. These incisions do not always heal well, and may leave a wide scar. Though we make every effort to create a perfect closure when suturing the incision closed, the soft tissues under the skin may occasionally retract and leave a sunken in area along the incision.

- **Pain:** Expect to have pain after surgery. The good news is that it will slowly go away. The worst pain usually lasts for 2 to 4 weeks. After that, the pain will slowly improve. It's possible that you will have some pain for as long as 3 to 6 months.
- **Infection.**
- **Damage to nearby structures, including the esophagus, trachea, thyroid gland, vocal cords, and arteries.**
- **Spinal cord or nerve damage.**
- **Bleeding or possible need for transfusion.**
- **Injury to the vertebral artery that, in turn, causes you to have a stroke.**
- **The bone graft shifts or become displaced. Or the bone graft doesn't heal like it should, which leads to the need for more surgery.**
- **Failure of the metal plates and screws to stay attached to the bone.**
- **A blood clot forming in your arms or legs.**
- **Chronic pelvic pain if your own bone is taken from your pelvis for a bone graft.**
- **Blindness if you have a drop in your blood pressure during the procedure, especially if you have glaucoma or diabetes.**
- **Heart problems 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'll have general  
anesthesia during  
your surgery.*  
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# Getting Ready for Surgery

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

## Go to your HiRise or VPEC appointment

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

At this visit:

- you'll bring a list of all the medicines you take, including herbal medicines and those you buy without a prescription
- you'll bring any medicines that are hard to fill and may not be available at the hospital
- you'll give some blood for testing
- you may give some of your urine for testing
- you'll find out what medicines you should not take on the morning of your surgery
- you'll 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, 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).

## Exercise to stay strong

The stronger and more fit you are before your surgery, the better you will do. We suggest walking, swimming and deep breathing exercises.

Cardiac and aerobic exercises are also helpful if they're approved by your medical doctor and you're 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.

## Start planning for your recovery at home

Patients get better faster when they go home to recover since it's helpful to heal in familiar surroundings. Unless occupational and physical therapy tell us you need to go to a rehab facility, you'll go to your home after surgery. Start getting your home ready now, and make your recovery as easy as it can be.



## 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'll 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 before you have surgery.*

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## Arrange your home to prevent falls

For the first few weeks after surgery, you'll 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's 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 while. We'll let you know at your follow up appointment when you can drive. You also will not be able to drive for as long as you are taking your prescription pain medicines.

After surgery, you'll 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's best if someone can stay with you at all times.

## 14 days before surgery

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

## 7 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!

## *7 days before surgery, stop taking these prescription medicines:*

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

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

## *7 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.

### **7 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.

### **3 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 and undergarments
  - 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 bring them unless we told you to at your pre-appointment. For example, if you take, Forteo, you'll need to bring it with you.

### **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. Only use the wipes below the chin. 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.

- You may not eat food after midnight, but you're encouraged to drink clear fluids.
- Most people can have clear liquids up to 2 hours before surgery.
- It's best to stop clear fluids when you leave the house or hotel to travel to the hospital on the day of 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

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## 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.

## When you come to the hospital, leave these things at home

- Do not bring your cane, crutches, or walker when you first come to the hospital.
- Make sure your cane, crutches, or walker are in the vehicle that is picking you up from the hospital. You'll need this to help you walk when you go home.
- Do not bring large amounts of money or valuable items, such as jewelry.
- You should leave your medicines at home. But if you are on a medicine that is difficult to find or fill, ask your clinic nurse or the nurse practitioner at VPEC if you should bring it with you from home.

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

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

- One friend or family member can come with you.
- You'll change into a hospital gown. You'll 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'll put an IV into your arm. An IV is a tube that goes through your skin and puts medicine directly into your body.
- You'll meet with your anesthesia team. They'll talk with you about your medical history. They may start managing your pain by giving you some pills to take by mouth.
- We'll take you to the operating room on a stretcher.





## Surgery

- From the Holding Room, we'll 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'll 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'll 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 neck. The length of this incision depends on how many levels of your cervical spine need to be corrected. Once the procedure is complete, your surgeon will close your incision.

### *Intraoperative traction*

During surgery, you'll be in intraoperative traction. This is a traction device that holds your head still so that there is no motion when you lie flat on your stomach during surgery. You will not be in traction when you wake up after surgery, but you will notice small sores on either side of your head where the traction was placed. These sores will heal quickly.

### *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's highly unlikely that you will need any blood during your surgery. It's rare that a patient may need blood transfusions either during or after cervical fusion surgery. We'll talk with you about this before surgery. If you are against getting blood products, please let us know.

## We'll 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'll 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'll use to treat your pain is what we call a "multimodal" approach. This means we'll treat your pain in multiple ways:

- We'll give you different types of pain medicines.
- We'll 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.

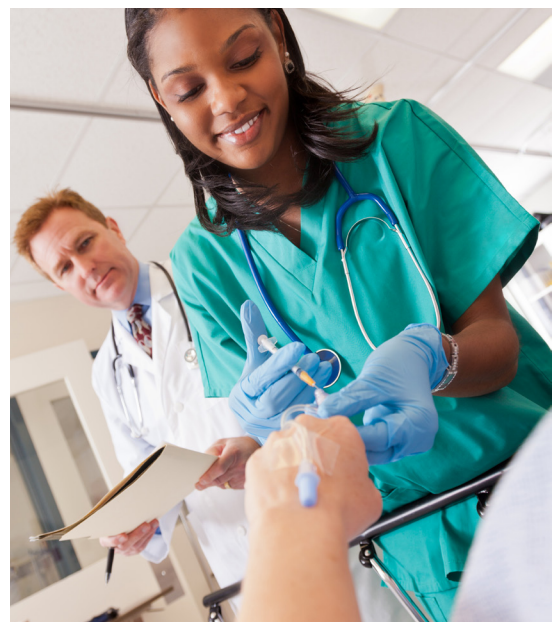
### *Pain management during surgery*

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'll 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'll give you prescriptions for these medicines when you leave the hospital, and you will take these medicines for a short time after surgery.



*We'll treat your pain in multiple ways.*

## After surgery, you'll go to the Recovery Room

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

- When you wake up:
  - a nurse will help you breathe deeply and have you cough to clear your lungs
  - you'll do ankle pumps to lower the risk of blood clots
  - you'll 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 thinks you are up to it, you may be allowed to have visitors once you are awake and your pain is under control.

### *We'll 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
- anti-nausea medicine through your IV

Once you eat solid foods again, we'll give you pain medicines by mouth instead of IV.

Some of these medicines include:

- tylenol
- muscle relaxers (Flexeril, Robaxin, Tizanidine and Valium)
- nerve pain medicine such as Gabapentin or Lyrica
- anti-inflammatory medicine like Toradol (as long as your kidney function is normal)
- opioids like oxycodone. This is only given as needed. You'll need to ask for it when in pain.

A Cryo Cuff will be used to help with swelling and pain near your incision.

Our pain management team is here to help you if you need it.

### *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.

Anesthesia and pain medicine can make you feel constipated so we'll also give you medicine to help you go to the bathroom.

During your hospital stay you'll 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 surgery, you might have a drain coming from the incision in your neck

The drain is in place to remove the extra fluid from the layers of tissue under your skin. This helps to lower the swelling in your neck and also allows the doctors and the nurses to monitor the amount of blood you have lost.

- If you stay in the hospital overnight, your drain will most likely be taken out on the morning after surgery.
- There's a chance that we'll leave your drain in place when you go home.
- If you do go home with your drain, your surgeon will talk with you about following up to have it removed.

## After the Recovery Room, we'll take you to a regular hospital room

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

## On the evening of your surgery, the surgeon will come by to see how you're doing

The surgeon will usually make their evening rounds sometime between 5:00 p.m. and 9:00 p.m. The exact time depends on when they finished their last surgery. Your surgeon will come to see you in your hospital room or the Recovery Room, depending on where you are at the time.

## Your surgeon will decide if you're ready to go home or if you need to stay overnight

Most patients who have cervical spine surgery, are able to leave the hospital that same evening or the next day. Once your medical condition is stable and your pain is under control with pills, it's actually better for you to be at home than the hospital. You're likely to rest better at home in familiar surroundings. It's also good for you to be up and moving instead of lying in bed, since too much bed rest raises the risk of blood clots.

## At first, we'll give you 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 again. At first, we'll give you ice chips and sips of water. Next, we'll give you a clear, liquid diet.

The morning after surgery, you take more steps to slowly going back to eating the foods you normally eat. At first, you'll start with soft foods and then gradually go back to more regular food.

## We'll help you get out of bed

If your surgeon decides you're ready to go home the evening of your surgery, we will help you when you get out of bed for the first time. And if you do stay overnight, we'll encourage you to get out of bed if you can. Starting on the morning after your surgery, whether you're in the hospital or at home, you may get up and down as much as you want and can tolerate.

## You may have trouble sleeping the evening of your surgery

At home or in the hospital, it can be difficult to sleep on the evening and night of your surgery. The surgery can disturb your regular sleep cycles. Some people also find it hard to rest in the hospital in general.

## Staying safe while you're 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's very important to stay safe and avoid falls while you are in the hospital.

### *Prevent blood clots*

In addition to plastic sleeves around your legs, we may give you blood thinning medicines. This is so we can help prevent blood clots from forming. Every day while you're in the hospital, we'll 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'll continue to do your breathing exercises and using your incentive spirometer. Exercising your lungs will help prevent pneumonia.

## The length of your hospital stay

How long you will be in the hospital 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're allowed to have visitors while you are in the hospital. You may even have 1 person age 18 or older stay with you at night. Each room has a pull-out bed.

## X-rays

Before you leave the hospital, we may take you to get X-ray images of your cervical spine.

## Switching you from IV medicine to pain pills

By the time you go home, your pain will be controlled by pain pills, and you'll no longer be on an IV. Your doctor will write you a prescription for pain medicines before you leave the hospital.

## Getting you ready to leave

Your surgeon may have an occupational or physical therapist come to see you while you're in the hospital to help decide if you are going to need any extra help when you leave the hospital and go back home.

### *Make sure you have a ride home*

You must have someone pick you up at the time you're released from the hospital. You will not be allowed to drive yourself home or leave the hospital alone. You may not take a taxi or bus.



# After the Hospital: Your Recovery

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## Caring for your incision

### *Bandages*

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

If you have stitches or staples, we'll make an appointment to remove them in 2 to 3 weeks.

- 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 may 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'll give you 4 aquaguards when you leave the hospital; you'll 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, clean your incision using soap and water when you're 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.
- Only swim or bathe when your doctor has cleared you.

### *Raising your arms overhead when you shower or brush your hair*

It's 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.
- Call us at (615) 875-5100 if you have a temperature higher than 101.5 F (38.6 C).

## Swelling

After this surgery, it's very common to have swelling in your neck. Every patient is different, but the swelling can last for weeks, even a few months. Every week, the swelling should improve a little bit. If you notice that the swelling is not getting better, then call us.

## If you have a neck brace

After your surgery, you might need to wear a neck brace as you recover. We'll talk to you about this. If you do have a brace:

- You may remove your brace 3 or 4 times a day for up to 1 hour at a time. When your brace is off, do not:
  - flex your neck (bring your head to your chest)
  - extend your neck (lift your chin up high and away from your chest).
- You can remove your brace when you need to shower or shave.
- For 6 weeks after surgery, you must ALWAYS wear your brace when driving or riding in a motor vehicle.
- If you have any skin irritation from the brace rubbing your skin, you may apply talcum powder between the brace and your skin. But be careful that you do not put any powder on your incision.
- You may use a scarf, handkerchief, or tube sock cut on the closed end to put around the brace to help keep your skin from getting irritated. This will allow you to wash the material you use around the brace without having to wash the entire brace itself.
- If you have a soft neck brace and need to clean it, you may wash your neck brace in cold water in the washing machine; but you'll need to let it air dry. Do not put it in the dryer.
- If you have a hard plastic neck brace, you can simply wash it in the sink with soap and water.

## Pain

Pain is simply part of the healing process. With time, you should have less pain than you had before surgery.

### *Pain and spasms between your shoulders*

When a spinal disc degenerates, it collapses. This causes the vertebrae on either side of the disc to fall closer together. When the bone graft is put in place, it stretches the disc height back to its normal place and the vertebrae are also pushed apart. This changes the structure of the spine and the muscles around it. Your body needs to adjust. Once the bone heals and your body has adjusted to the new position, the pain should go away.



.....  
*It's normal to have pain  
after surgery.*  
.....

### ***Before your bones fuse, you may actually have more pain after surgery than you did before.***

About 20 percent of patients have more pain after this surgery than they did before surgery. The pain is caused by small movements of the unfused bone irritating the nerves. Once the bones fuse, the pain will get better.

### **Understand your prescription pain medicine**

- When you left the hospital, we probably gave you a prescription for pain medicine. While you may need prescription pain medicine at first, it's best to start lowering how much you take as soon as you can.
- If you were taking medicine(s) before your surgery, do not take those with any new prescriptions you get from the surgeon.
- 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 see a pain management doctor, you'll need to have an appointment 7 to 10 days after discharge to get back on your home medicine schedule.
- We can't refill your narcotic pain medicine without an office visit.
- We'll provide some narcotic pain medicine when you go home, to allow time for this appointment.

- We cannot 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.
  - We cannot mail narcotics to your home.

### ***Expect to take less pain medicine over time***

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

- When you first leave the hospital, we'll give you a prescription for pain medicine with specific instructions.
- We recommended that you lower your use of pain medicine slowly. If you're 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're able to stop taking them all together. You may be given specific instructions on how to do this when you're discharged.

## 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 exceed the recommended dose either by accidentally taking multiple acetaminophen-containing products without realizing it, or by not following dosing instructions.
- Narcotics such as Percocet, Vicodin and Norco have acetaminophen in them—from 325 mg to 500 mg per tablet. It's very important that you know the dosage and that you do not combine it with other products containing acetaminophen.

## For 3 months after surgery, do not take any NSAIDs

Do not use any NSAIDs, such as Ibuprofen, Motrin, Advil, Aleve, Celebrex, etc., for at least 3 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.

## Sleeping

For the first 7 days after your surgery you need to sleep with your head raised about 30 degrees. Ask us to show this to you. You can use pillows to keep your head up. Or you can sleep in a reclining chair with the head of the chair in the semi-upright position. You may sleep on either side of your body or on your back. It's important that you sleep in a raised position to help reduce the swelling in your neck.

After 7 days, you may start sleeping in a flat position if you feel comfortable. It's probably best to slowly lower the height of your head until you adjust to a flat position.

## Walking

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.



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*Walking is great exercise and helps your body heal faster and get stronger.*  
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## Riding in a car and driving

- You should not drive for 2 weeks.
- Never drive when you are taking prescription pain medicine.
- If you are required to wear a brace, you should not drive during this time.
  - Some states do not allow collars when driving. If your state does not allow you to drive with a collar, you cannot drive for the first 6 weeks after surgery.
  - Remember that you'll have limited motion of your neck while driving and wearing your brace. Because of this, your peripheral vision will be limited and driving could be dangerous.
- When you first start driving again, avoid driving during the busy traffic times.
- Remember to carefully position your mirrors before starting to drive.

### *Riding as a passenger*

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



## Protect your neck as you recover

- No athletic activities until you have discussed your limitations with your surgeon at your 6-week check up.
- No lifting more than a total of 15 pounds unless otherwise instructed by your surgeon.
- No overhead activities (washing your hair and brushing your hair are OK).
- No pulling or pushing with your arms.

## Sexual activity

It is safe for you to have sex as soon as you feel it's comfortable. As you recover, the safest position is for you to lie flat on your back.

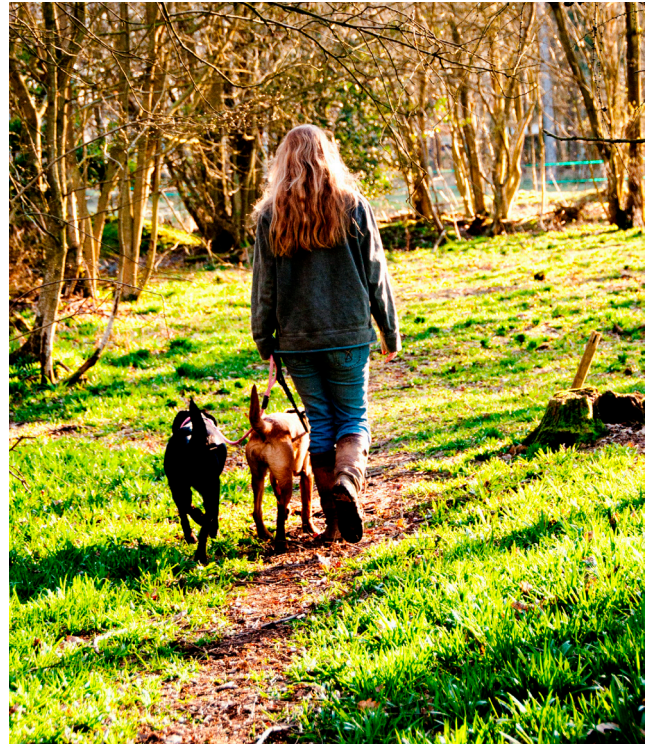
## Preventing setbacks

If you have increased pain for more than 2 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.

## Staying safe if you have pets

If you have pets, you'll 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's a large dog that pulls.

Also, it's very easy to trip over pets, and you'll 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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# After Surgery: What to Expect

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## Keep your 2-week follow-up appointment

It's important to keep your follow-up appointment. Most patients have a follow-up appointment at 2 weeks and again at 6 weeks. 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

Even though you are 6 weeks out from surgery you are still not fully healed. The bone takes 4 to 8 months to fully fuse and heal. Until that time, you may still have some aches and pains in your neck and between your shoulder blades. 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.

Here are some ways to help your body heal faster:

- Do 30 to 40 minutes of aerobic exercise 3 to 4 times per week, which feeds the growing bone with oxygenated blood.
- Avoid extreme motion in your neck. 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 your surgery*

If you had numbness for more than 3 weeks before your surgery, it's 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

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## How long will my neck be swollen?

Every patient is different. The swelling can last for weeks, even a few months. The swelling should get better a little bit each week. Call us right away if it's not slowly getting better.

## 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.



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

## Why do I have pain and muscle spasms in between my shoulders?

When the disc degenerates, it collapses. When the bone graft is placed, it stretches the disc height back to its normal place, which is a change. Once the bone heals and your body adjusts to the new position of these bones, your pain should go away.

## How soon is it safe 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?

Please avoid all overhead lifting. You can lift light weights (less than 15 pounds) while you are recovering. Keep the weights close to your body when you lift. Also keep your neck in a neutral position when you lift.

## 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.

