

The Spine Surgery Book

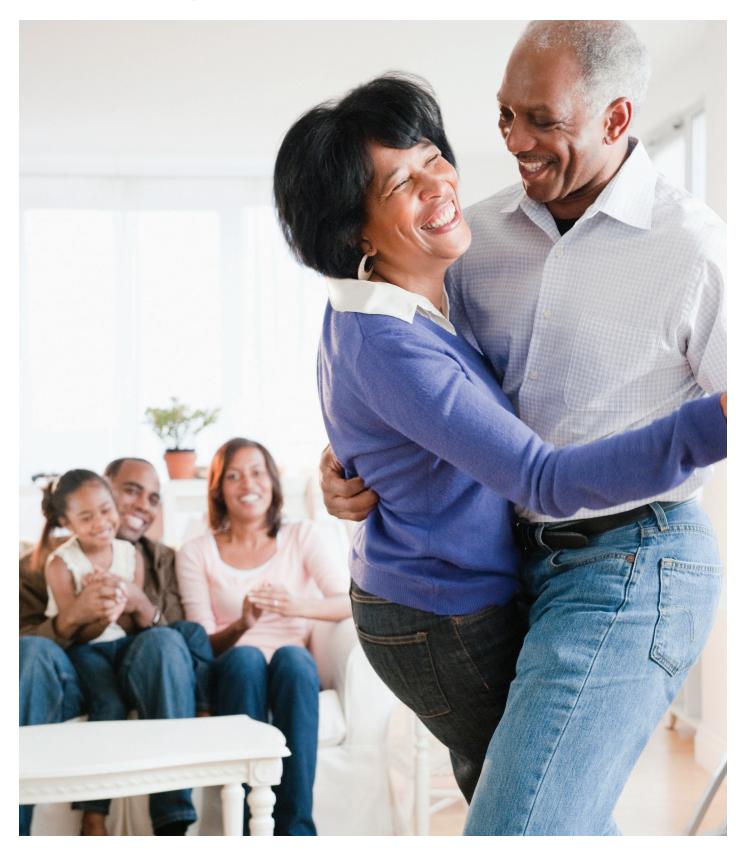
Preparing for and recovering from back and neck surgery

Table of Contents

Understand Your Spine1
Anatomy
Spine Conditions
Surgical Procedures
Prepare for Surgery
Your Self
Your Home
Your Friends & Family
The Day of Surgery
Understand Recovery
Spinal Precautions
Incision Care
Dos and Donts
Enhance Your Recovery
s this Normal?
The Inpatient Experience
Inpatient Therapy
Packing List
Your Discharge

This booklet is general patient education material and not a substitute for professional medical care; your individual care may differ based upon your unique clinical care needs and your physician's professional medical judgment.

Understand your spine



Anatomy

Spine basics

In order to understand how surgery can help your spine, it is important to understand how your spine works with the rest of your body. The spinal column is a stack of bones (vertebrae). They are separated by soft pads of tissue called discs. In the middle of each of these bones, there is a canal (the spinal canal) that runs top to bottom. Running through the spinal canal is a long bundle of nerves and nerve cells called the spinal cord. These nerve fibers carry signals between the brain and body. The spinal cord, just like the brain, is surrounded by the cerebrospinal fluid (CSF) and protective layers called meninges.

Spines are made up of these parts:

- 1. Spinal canal: A cavity that runs successively through the vertebrae and contains the spinal cord.
- 2. Spinous process: The back part of each vertebra you can feel through your skin.
- **3. Vertebrae:** The 24 bones that connect like puzzle pieces to make up the spine.
- 4. Disc: They lay between each of the vertebrae and act as cushions.

Spine conditions

Bone spurs

Also known as osteophytes, bone spurs are thickened parts of your bones. They can occur in any part of the spine. The extra bone growths can limit spine movement and pinch nerves. This may cause neurological deficits and pain.

Cauda equina syndrome

Cauda equina means "horsetail" in Latin. It describes the lowest portion of your spinal cord. When there is a dysfunction of the nerves at the end of your spinal cord, it is referred to as cauda equina syndrome. The severity of your symptoms depends on which nerves are affected and how serious the injury is.

Herniated disc

This can also be referred to as a bulging or ruptured disc. This occurs when there is a small tear or rupture in the disc, and part of it pushes into the spinal canal. This injury can happen in any part of the spine, and symptoms depend on what part of the spinal canal is being pushed.



Myelopathy

Myelopathy is an injury to the spinal cord due to irritation or pressure. When the injury is due to trauma, it is commonly referred to as a spinal cord injury. Myelopathy has many other causes, including herniated discs and stenosis.

Osteoarthritis (spondylosis)

Osteoarthritis is the most common form of arthritis. It is caused by the breakdown of cartilage in your bones. When it affects your spine, it is referred to as spondylosis. This condition gets more common as we age.

Radiculopathy

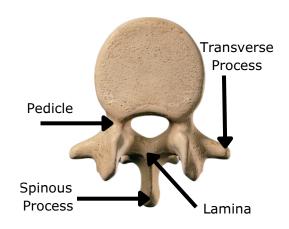
This occurs when there is compression or pressure on a nerve. This compression can cause numbness, tingling, weakness, or pain. It is also known as a "pinched nerve." If you suffer from sciatica, there is pressure on your sciatic nerve.

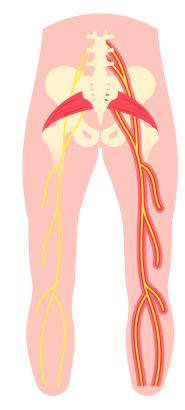
Spinal stenosis

As osteoarthritis gets worse, it can cause narrowing of the spinal canal. This puts pressure on the nerves in your spinal cord. This is also known as spinal stenosis. It can lead to weakness, pain, or numbness in your arms or legs.

Spondylolisthesis

Commonly referred to as a "slipped disc", this is when one of your discs moves, forcing your spine into unnatural positions.





Surgical procedures

Your surgeon will discuss your past medical history and review your images to determine which procedure will be the best solution for your spine.

ACDF: Anterior cervical discectomy and fusion

This is one of the most common spinal surgeries. A small incision is made in the front of the neck. Your disc will be removed and replaced. In some cases, the neck will be stabilized with implants which may include an intervertebral cage, a plate, screws, or all three. This procedure is considered minimally invasive. It uses microscope technology and is performed through a 1-2-inch incision in the front of the neck.

Posterior cervical fusion

This procedure is similar to an ACDF, but the incision is made through the back of the neck (posterior) rather than the front of the neck (anterior). A small incision is made in the back of the neck and the part of your disc placing pressure on your nerves will be removed. In some cases, the neck will be stabilized with implants which may include an intervertebral cage, a plate, screws, or all three.

Cervical total disc replacement

This procedure removes a damaged disc to relieve pressure. It is replaced with an artificial disc. The new disc is MRI compatible. This procedure is considered minimally invasive. It uses microscope technology and is performed with a 1–2-inch incision in the front of the neck.

ACCF: Anterior cervical corpectomy and fusion

This procedure involves removing a vertebral body to relieve pressure on the spinal cord and/or nerve roots. An ACCF is considered minimally invasive. It uses microscope technology. The surgery is performed through an incision in the front of the neck. Once the vertebral body and adjacent discs are removed, a bone graft is implanted to allow for fusion of the bone segments into one long bone. Other hardware may be used to provide stability and strength to the area, including plates and/or screws.

Microdiscectomy

This procedure is performed to remove a damaged disc that is compressing a nerve root. A small part of bone and the disc material that is causing nerve root compression is removed. Usually, only part of the disc needs to be removed. Space is created to prevent future compression of the nerve roots and spinal cord. This procedure is considered minimally invasive, performed through a 1–2-inch incision.

Interbody fusion

This procedure joins two or more vertebral segments together to form one stable bone. This stops motion in that section of the spine. This may be needed when there is abnormal motion between the vertebrae which may also cause compression of the nerve roots and/or spinal cord. Other indications for spinal fusion can include spinal deformity and spinal defects. The surgery is performed through one or more incisions. The size of the incision(s) will depend on the number of vertebrae affected. Removal of bone or removal of the disc may also be needed in some patients depending on the type of surgery. Hardware, such as screws, rods, cages and/or bone grafts are implanted to hold the spinal column in place so that the bones can heal and fuse together.

There are many types of spinal fusions, including fusions with surgical approaches from the front (anterior), the back (posterior), both front and back, and/or from the side (lateral):

- Anterior lumbar interbody fusion (ALIF)
- Posterior spinal fusion (PSF)
- Posterior lumbar interbody fusion (PLIF)
- Transforaminal lumbar interbody fusion (TLIF)
- Posterior lateral fusion (PLF)
- Extreme lateral interbody fusion (XLIF)
- Oblique lateral interbody fusion (OLIF)

Laminectomy

This procedure involves removing a small piece of vertebra (lamina). This relieves pressure on the spinal cord and/ or nerve roots. The goal is to remove the least amount of bone possible while still creating enough room for the spinal cord and nerve roots. This surgery can be performed by itself but can also be performed in combination with a spinal fusion.

Foraminotomy

This procedure relieves pressure caused by excessive bone growth around the nerve roots. Part of the bone and bone spurs in the intervertebral foramen are removed. This allows for more room for the nerve roots and relieves pressure. This surgery can be performed by itself but can also be performed in combination with a laminectomy and/or spinal fusion.

Surgical procedures (cont.)

Know the risks

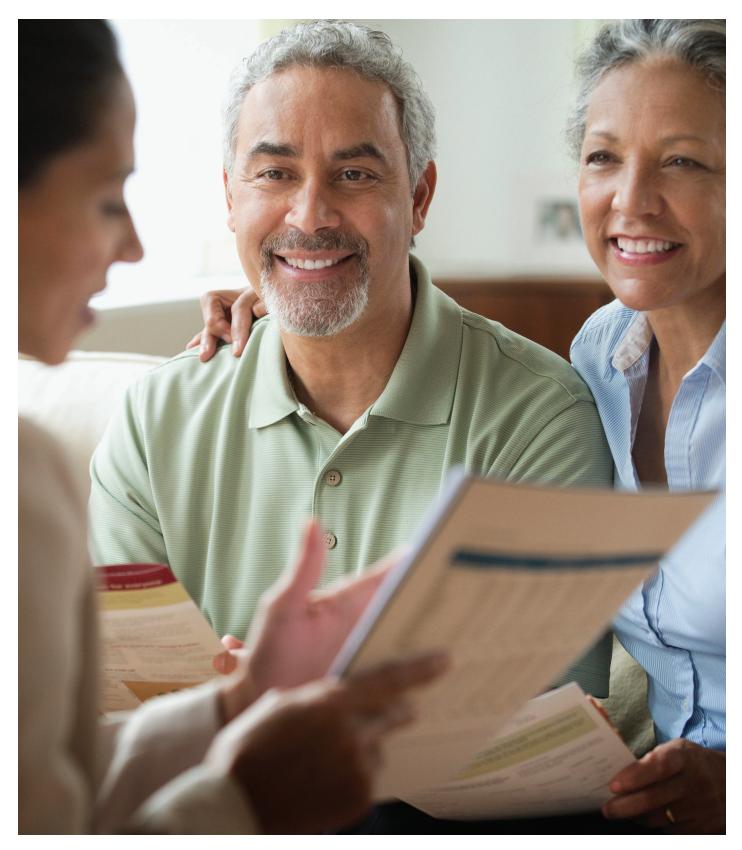
Spine surgery, even minimally invasive, is a major surgery. Most surgeries require general anesthesia with a breathing tube inserted during the procedure. While every precaution is taken by your team to prevent complications, some do still occur. These complications include:

- infection
- bleeding
- pain not improving or getting worse
- persistent hoarseness and trouble swallowing
- post-operative pneumonia
- nerve damage leading to paralysis
- blood clots
- muscle weakness
- loss of function or control in bladder or bowel
- failure of the bone to fuse and
- adjacent segment disease
- death

Expectations

The purpose of spine surgery can be to reduce pain, to prevent further nerve damage, or both. Some patients may notice improvements right away. Some may notice more gradual improvements over time. As your nerves heal, you may feel different sensations, including numbness, and tingling. This is normal and should be expected as your body heals. There are many factors affecting the length of the recovery process, such as how quickly bones fuse or nerves heal. While improved mobility and decreased pain may occur right away, it is important to remember full recovery can take up to a year.

Prepare for surgery



Prepare your self

Health screenings

Schedule any health screenings your surgeon needs as soon as possible. This may include labs, health clearances, tests, and imaging. If you have diabetes, you may need to have an A1c test before your surgery. Make an appointment with your Primary Care Provider a few weeks after your surgery.

If you have a pain contract, please inform your provider you will be having surgery. It is common for us to prescribe opioids during and after your surgery, and we do not want to compromise your pain contract by doing so. A simple phone call letting them know you are having surgery is all you need to do.

Quit smoking

Nicotine use increases your chances of a complication after surgery.² These complications may include:

- Breathing problems
- Infection
- Blood clots
- Delayed healing

The standard recommendation is quitting 4 weeks prior to surgery and refraining until 6 months after surgery.

Alcohol consumption

Please avoid drinking alcohol before and after your surgery. Do not drink alcohol if you are taking pain medication.

Resources

1-800-QUIT-NOW www.quit.com www.quitassist.com

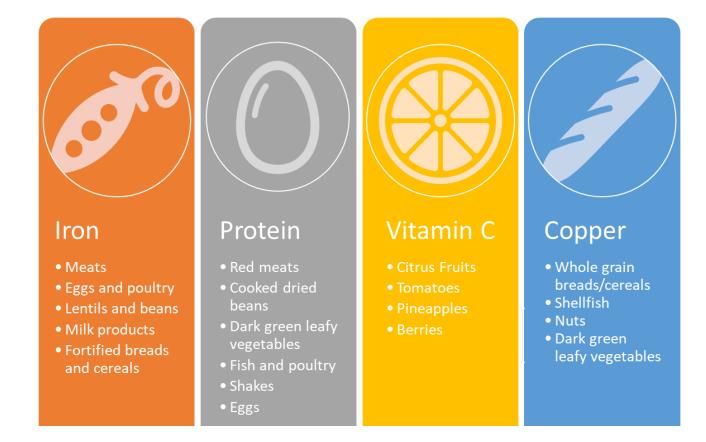
Provide paperwork

Please let your clinical team know about any paperwork you will need after surgery. This can include:

- FMLA paperwork
- short-term disability
- anything you may need for your employer

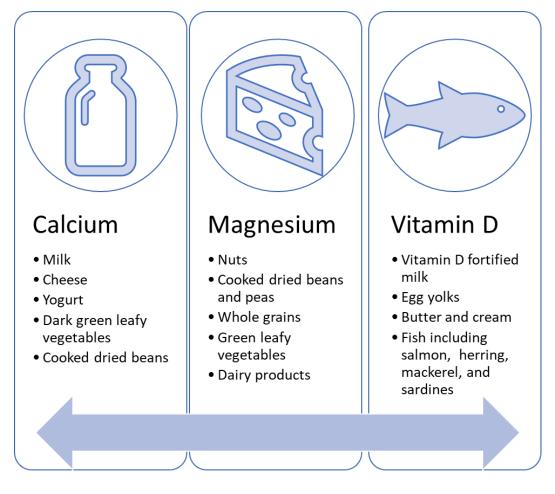
Diet & nutrition tips

Nutrition is important for wound healing.³ It is helpful to eat a variety of foods from every food group to get nutrients your body needs.



Prepare your self (cont.)

You are often required to stop taking vitamins and supplements prior to your surgery. If that is the case, here are some foods you can eat to increase your intake while you are off your supplements. Each one of these nutrients is an important part of your body's healing process.



Calcium is an important nutrient for your spine.⁴ Eating foods with magnesium and Vitamin D will increase the amount of calcium your bones absorb. Increase your intake of all three of these nutrients to improve your recovery.

Prepare your home



Living spaces

1. Check all railings in your home.

This may include railings going up to your front door or back door. You will find yourself relying on them more than usual for the first few days, so make sure they are nice and sturdy before you leave.

2. Designate a recovery area.

This may be a couch, chair, or even a bed. Ensure you have a clear path to a bathroom and a kitchen.

3. Place items you will often use next to your recovery area.

This may include phone chargers, water, notebooks for keeping track of medications, and other necessary items.

4. Create a clear path for yourself.

Remove area rugs, hall runners, and small furniture items like coffee tables. If you have electrical cords, secure them to walls. Put pets away when you stand up and walk around the house. They can come back when you are safely sitting down again. Wear safe shoes around your house, do not wear slippers or flipflops.









Prepare your home (cont.)

Bathrooms

- 1. Check bathroom railings next to the toilet and shower to ensure they are safe and secure.
- 2. If you do not have railings in your bathroom, there are assistive devices you can buy rather than installing expensive railings.
- If you do not have a walk-in shower, you can buy a transfer bench. This allows you to sit outside of the shower and scoot over to enter the shower without having to lift your legs over the edge of the tub.
 Pictured here are a transfer bench and toilet seat riser.



Other assistive devices

You can buy other assistive devices. These are available at local medical equipment stores or online retailers. You may be able to borrow them from friends and family who have had surgery. These are not required but may help you be more independent after surgery.



Prepare your friends & family

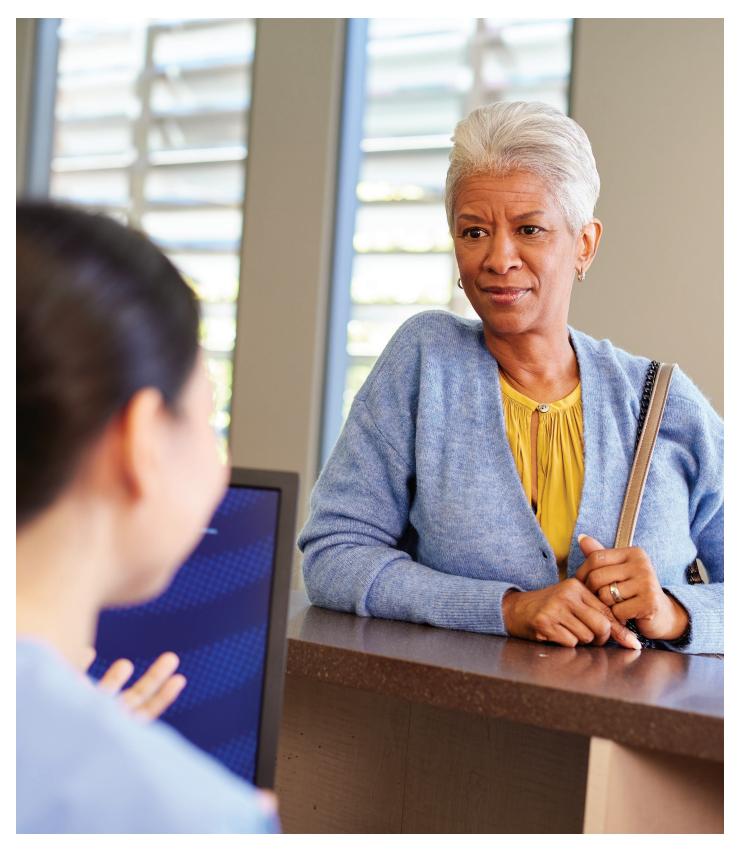
Designate a care team

We strongly recommend having a family member or friend support you through your surgery and recovery. It is important that they attend your appointments with you. Having a second set of ears can help ensure you understand your plan of care. Their encouragement and companionship will keep your spirits up and help you heal. Choose someone you trust to cheer you on and remind you of your temporary limits. If you don't have support, talk with your care team. They will help determine other options to ensure you have a safe discharge plan in place after surgery.

Infection prevention

Handwashing is the most effective way to prevent infection.⁵ Wash your hands with soap and water frequently. Remind your family members to do the same. This is important in the hospital and at home. Consider placing sanitizing gel and disinfecting wipes around your home, especially near your recovery area. Have everyone who comes to your home use them or wash their hands.

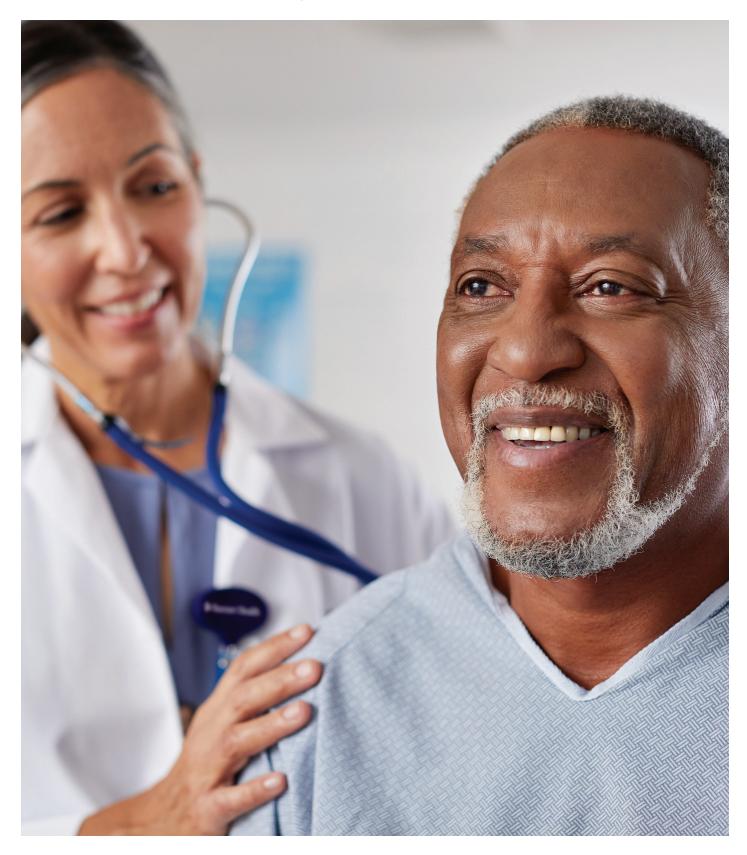
The day of surgery



What to expect

- First you will check-in at the registration desk with your photo ID and insurance card. They will give you an arm band, which will be your identification for your hospital stay.
 - o If you need help getting around the hospital, wheelchairs and assistance are available for you at the registration desk.
- You will then be directed to the surgery waiting room. You will check-in here for your surgery.
- You will wait in the surgery lobby until you are called back to the pre-op area.
- In the pre-op area, you will be directed to a small room with a bed. You will be asked to use the restroom and put on a hospital gown. You will be given antibacterial wipes to cleanse your entire body.
- You will then speak with your surgical team. You will meet your anesthesia and nursing teams. You will be asked questions about your medical history and about the current surgery being performed. The team will answer any questions you have.
- You will have your IV placed and your anesthesia team will give you medication, making you quickly fall asleep. You will be asleep for your entire surgery.
- When you wake up, you will be in recovery/ post anesthesia care unit (PACU). A nurse will be monitoring you closely and keeping you comfortable.
- Once you are awake and your pain is at a tolerable level, you will either go home or be transferred to your hospital room.

Understand recovery



Your recovery period

Your recovery period starts from the time of your surgery until your surgeon releases you from movement limitations. For some, this will be three weeks. For others, it will be for 3-6 months or more. It all depends on your surgery and your recovery. You must follow Spine Precautions during your recovery period. You will need to follow these precautions until your surgeon tells you otherwise.

Spine precautions

Avoid BLTs (Bending, Lifting, and Twisting)





No bending

No bending at your waist if you had back (lumbar) surgery. No bending at your neck if you had neck (cervical) surgery.

No lifting

No lifting more than 10 pounds during your recovery period. This also includes pushing and pulling anything heavier than 10 pounds. No lifting your arms above your head if you had neck surgery.



No twisting

No twisting from your waist if you had back surgery. Keep your hips and shoulders facing the same direction. No twisting your neck if you had cervical surgery. Keep your nose and shoulders facing the same direction.

Movement techniques

We understand it is not easy to move around while following these precautions. Before you go home, we will show you techniques like a log roll to assist you when you get home. If you are staying in the hospital, our therapy teams will work with you to practice these techniques before you go home. Feel free to look up videos on log rolls and spine precautions before your surgery.

Lying down

- Use the log roll technique to get out of bed
- When lying on your back, you may place a pillow under your knees and/or your lower back for comfort
- When lying on your side, you may place a pillow between your knees for comfort
- Do not pull your legs toward your chest

Sitting

- Sit in a rigid chair with arm rests
- Avoid rocking chairs, recliners, and other soft furniture
- Keep your feet firmly on the ground and do not elevate your legs
- Find a chair where your hips are slightly higher than your knees to make standing up easier

Standing

- Keep your feet flat on the floor
- Stay in an upright position
- Put items at waist height to avoid bending When using a walker, have at least one hand on the bed or chair when sitting or standing to prevent the walker from tipping
- Wear sturdy shoes







Incision care

- Keep your incision(s) clean and dry. Your surgeon will tell you when to remove your bandage and take a shower. Avoid baths, pools, or submerging your incision until it is completely healed. Do not let the water hit directly on your incision.
- Do not apply ointments, lotions, or anything else to your incision. Your healing wound is new skin and should be protected from the sun. Cover your incision when outdoors.
- Some swelling and redness near the incision site is normal for several weeks after surgery.
- Some drainage is normal after surgery. Oozing should decrease and then stop.
- Continue drinking plenty of water and eating a balanced diet high in protein, vitamins, and minerals to help with healing.
- Keep yourself and your home environment clean. Use fresh linens and change your clothing daily.
- Keep pets, kids, and hazards away from your incision area.
- Do not smoke! Smoking delays healing.

Watch your surgical incision for symptoms of infection. Some swelling, redness, and drainage is normal, but if it doesn't improve, increases, or you develop any symptoms listed above, please notify your surgeon.

Symptoms of infection:

- Increased redness, drainage, or swelling at the surgical incision
- Increased warmth or tenderness at or around the surgical incision
- Persistent fever (higher than 101.5 F)
- Chills or shaking

Pain after surgery

It is normal to have pain and discomfort after spine surgery. It is important to discuss your pain management plan with your surgeon before surgery. You will have several options to help keep you comfortable. We will use a combination of prescription opioid medications and medication-free therapies. Using more than one option will help reduce the need for prescription opioid medications.

Prescription opioid medications

Prescription opioid medications can be very effective in managing pain, resulting in better movement and aiding in restful sleep. However, they are not intended for long-term use. It is important that you follow the instructions you are given. Keep track of the times that you take your medications to avoid taking them more frequently than prescribed. They should be used initially after surgery, as needed, and then significantly less after that. As your pain lessens, start increasing the length of time between your doses until you are no longer taking them.

Opioid medications have several side effects. Common side effects include constipation, upset stomach, drowsiness, and itching. Other potential side effects include lightheadedness, confusion, difficulty urinating, anxiety, or trouble concentrating.

Eating something prior to taking them and drinking 8–10 glasses of water per day can help prevent some of the side effects. These medications can impair your judgment, so please do not drive or make important decisions while taking them. Also, avoid consuming alcohol while taking them. Be sure to put your pills in a safe place so others do not have access to them.

Studies show patients who undergo spine surgery are at a higher risk of opioid abuse.⁶ Therefore, we take many precautions including adhering to all local and federal regulations as well as Banner Health opioid prescription policies.

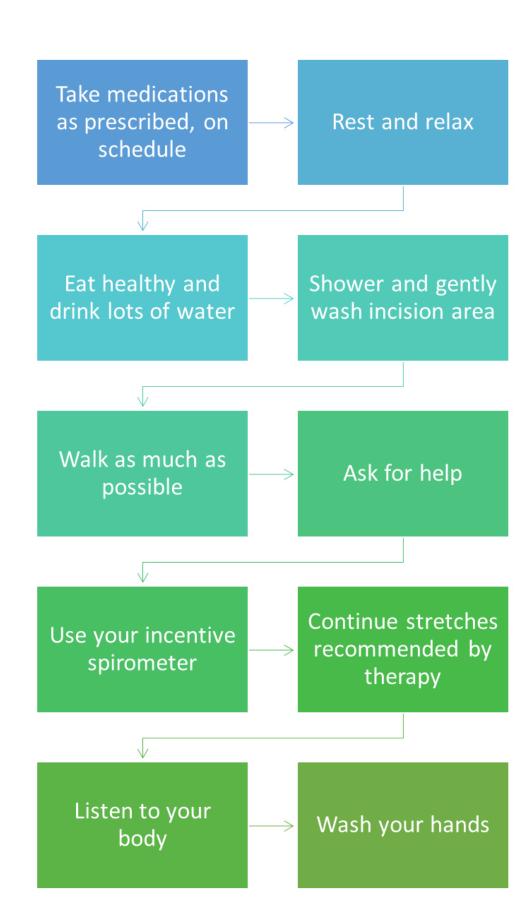
Medication-free therapies

Medication-free therapies can be helpful in managing your pain. Stiffness and swelling are expected after surgery and will contribute to your pain. Be sure to add these interventions at home to keep you comfortable.

- Ice packs can provide comfort, decrease swelling, and help with pain control after surgery. Be sure to place a towel between your skin and the ice pack. Ice the area for 20 minutes at a time to avoid frostbite. Do not use ice when sleeping. Use ice for the first 2 weeks, or longer, if needed. Avoid using heat near your incision area. Heat may be applied to muscles away from the incision to reduce spasm discomfort.
- Frequent walking and position changes will help build strength and reduce stiffness and soreness. Try to take
 a short walk or change positions every 1–2 hours while awake. Take your time with any activity and listen to
 your body. Be careful not to overdo it as that can cause more pain and swelling.
- Aromatherapy can alter the brain's perception of pain and help improve mood.
- Distraction with activities such as listening to music, watching TV, or playing games can divert your attention from the pain.
- Guided imagery, relaxation, or meditation can help reduce stress levels and ease anxiety.
- Spiritual support through individual prayer or from your spiritual or religious affiliation can help give comfort and reduce anxiety.

Banner Brain & Spine

DOs





Enhance your recovery

Blood clot prevention

If you were walking before your surgery, we want you to be walking soon after surgery. Remain as active as possible and increase your activity as you are able. Pumping your ankles and walking are activities that will keep your blood moving and prevent your blood from sticking together or forming clots. Make sure you are pumping your ankles or walking every hour you are awake to keep your blood moving.

If you stay overnight in the hospital, you may have Sequential Compression Devices (SCDs) on your legs. These may be uncomfortable but are incredibly important to use all the time the first few days after surgery. Please wear them at all times while you are in bed.

Pneumonia Prevention

It is important to take steps to prevent pneumonia after surgery. Coughing with a new spine surgery can be painful and can decrease your chances of a good outcome. There are 3 main things you can do to prevent this from occurring. First, use your incentive spirometer breathing tool or take big, deep breaths to expand your lungs. You should do this every hour during the day. Second, get out of bed and increase your activity as much as possible. Third, brush your teeth. This keeps you from swallowing large amounts of bacteria. These tasks will give you the best chances of preventing pneumonia after surgery.

Take charge

There are a few important things you can do to assist in your recovery.

- Wear your SCDs. These are the wraps that will go around your calves to keep you blood circulating. They are very important in preventing blood clots for those first few days when you are not moving around very much.
- Take deep breaths using your incentive spirometer. This is the number one way for you to prevent getting pneumonia after surgery. Use it 10 times per hour, every hour you are awake. If you are not given one, please ask your nurse for it.
- Brush your teeth. This keeps bacteria out of your mouth, preventing illness after surgery.
- Stay on top of your pain medications. It is very important to stay ahead of your pain, as it can be difficult to catch back up. You will probably be prescribed a few types of pain medication, all designed to help different kinds of pain. Please let us know if they are not working. We want you to be comfortable enough to walk and to sleep. Our medical teams also have federal, state, and hospital regulations they must follow to ensure your safety if they need to increase your medications. Our goal is to make you comfortable, but please be patient and understanding with your care team.
- Move as much as you can. It will be uncomfortable at first, but it is important to work through the pain.
- Eat nutritious foods and drink lots of water.
- Make an appointment with your Primary Care Provider after your surgery.

Is this normal?



Green: Go - Things are OK if you experience:

Most patients experience some or all of the following:

- Small amount of redness around the surgery site that is not hot to the touch, splotchy, or streaking
- Minor constipation or minor appetite loss
- Upset stomach but still able to keep food down
- No fever or low fever (less than 101.5 F)
- Pain or stiffness
- Slight increase in numbness or tingling
- Sore throat or feeling like you have a lump in your throat (if you had cervical spine surgery)

Daily action plan

- Surgery site: Continue to check daily. Site should get better each day. Keep covered if draining.
- Constipation: Take stool softeners as prescribed, drink lots of fluids, and eat high fiber foods.
- Upset stomach: Take pain medicine with food.
- Low fever: Use breathing tool, or take 10 deep breaths every hour.
- **Pain, stiffness, and swelling:** Use ice packs 3-5 times a day. Take pain medicines as prescribed. Walk and change positions frequently to prevent stiffness.





Yellow: Caution - Call your doctor if you experience:

- Any new drainage, worsening redness or swelling around the surgery site, or the surgical incision begins to pull apart
- Constipation that is not better with fiber, water, and stool softener and/or laxative medications
- Nausea, vomiting, or abdominal pain that is not getting better
- Fever greater than 101.5 F, with or without chills
- · Pain unrelieved by rest and pain medications
- New pain, swelling, weakness, or numbness
- · Feeling confused, or family thinks you seem confused
- Increased heart rate or heart palpitations
- Worsening of your preoperative symptoms

Action plan

Help is available for your urgent needs, even when the office is closed. Call your surgeon's office if:

- You have any of these symptoms
- You have any questions or concerns
- You go to the hospital

Red: Stop - Call 911 or go to the emergency room if you experience:

- Sudden numbness or weakness (especially on one side of the body)
- Sudden loss of balance
- Sudden, severe headache
- New shortness of breath or trouble breathing
- Pain in your chest, jaw, neck, back, or in one or both arms
- Not able to urinate, or loss of bowel or bladder control
- Extreme difficulty swallowing

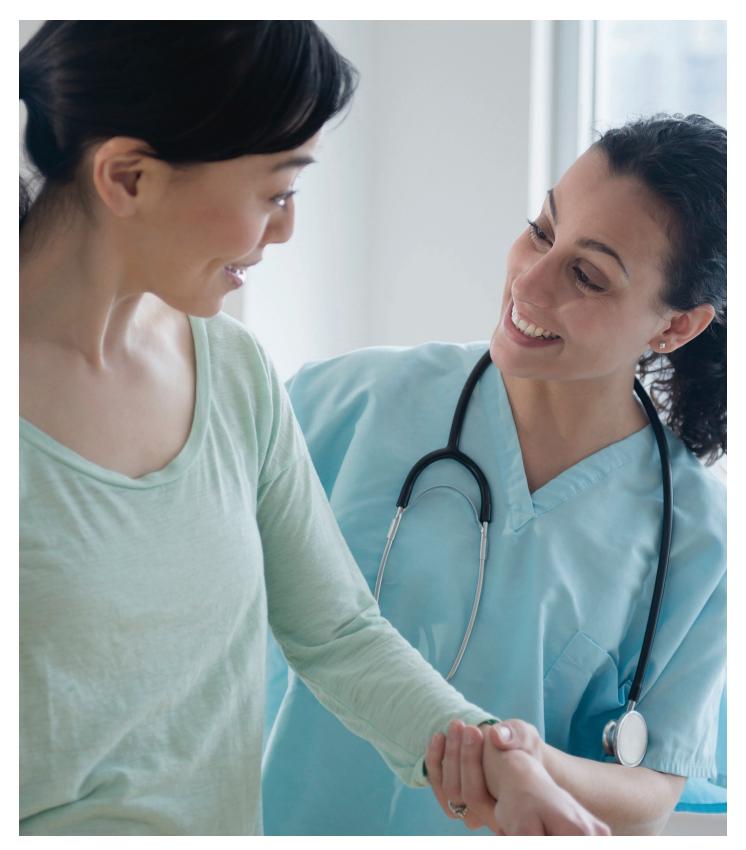
Action plan

- Call 911 or go to the nearest Emergency Department
- Call your surgeon if you go to the hospital





The inpatient experience



Inpatient therapy

Most patients will have at least one visit from our therapy team. You may require any one of the below therapies, or even a combination of a few of them. Expect your first visit to be within 24 hours of your surgery and the goal is to get you sitting, standing, or walking, depending on your surgery and your activity level prior to surgery.

Occupational Therapy

Occupational Therapy is designed to help you move in your everyday life. This includes showing you ways to shower, cook, get out of bed, and more.

Physical Therapy

Physical Therapy is designed to get you back to moving as much as you did before your surgery soon as possible. They will also get you ready for any challenges you may face when you get home, for example getting up the stairs.

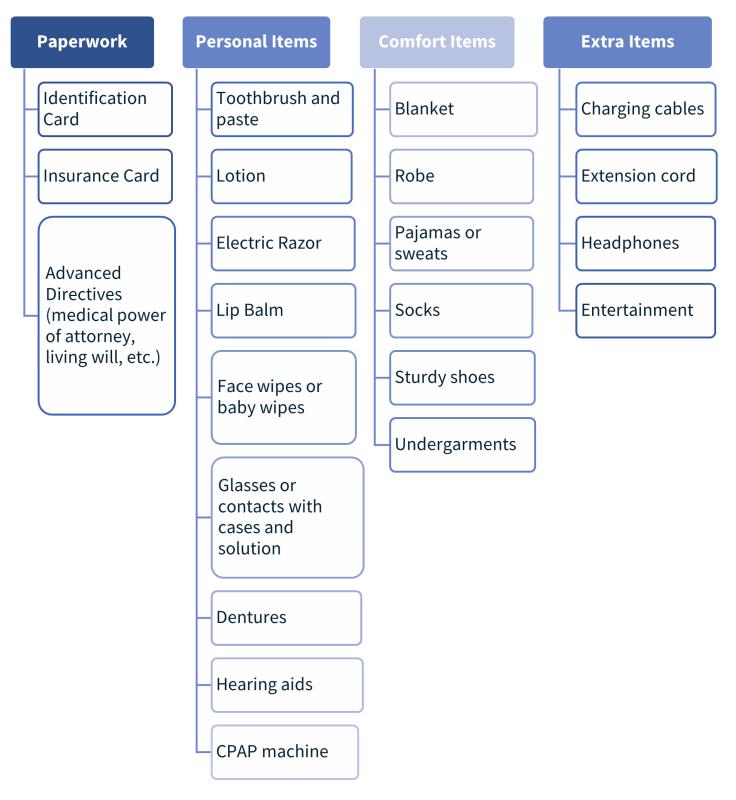
Speech Therapy

If you have cervical surgery, especially if it is on the front of your neck (anterior), you may also visit with a Speech Therapist. They will help you with swallowing and eating after surgery.

Braces

If your surgeon would like you to wear a brace, your therapist will help you with the brace before you leave the hospital. They will show you how to put it on and take it off, make sure it has the proper fit, and show you how to care for the brace. Not every patient needs a brace after surgery.

Packing list



Your discharge

When your surgical team approves you for discharge, you will either go home or to a facility. Specific criteria must be met for each level of care, mandated by Medicare.

Discharge home

When you are discharged home, you will need a driver and someone to stay with you for the first 24 hours of your recovery.

- Medications You may be prescribed medications prior to your discharge. If you would like to pick them up from your regular pharmacy, let your nurse know. If your facility has a pharmacy onsite, we recommend using it to ensure your medications are in hand before leaving the hospital. This prevents complications that may arise from medications being out of stock and other potential delays.
- Durable Medical Equipment When you are ready to go home, your medical team may prescribe Durable Medical Equipment (DME). You may need a walker, wheelchair, brace, or other DME. A therapist will bring your DME to you and show you how to use it.
- Home Therapy Some patients may require additional assistance once at home. If you meet the criteria, you may be given orders for in-home nursing visits, in-home Physical Therapy, and other in-home assistance. Your case manager will assist in these orders.

Discharge to rehabilitation

Some patients may require a stay at a rehabilitation facility before they go home. This could be an inpatient rehab, skilled nursing facility, or another type of rehabilitation facility. There are requirements that must be met for each of these facilities. Your medical team will let you know what you need, and your case manager will help with your transition.



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