

### **Description**

The spine consists of five separate divisions: cervical (seven vertebrae), thoracic (12 vertebrae), lumbar (five vertebrae), the sacrum, and the coccyx. Each vertebra, interlocks with the segment above and below it through the superior and inferior articular processes. Between each vertebra is an intervertebral disc that provides cushioning for the spine. The lamina and pedicle, along with the vertebral body, provide the borders that create the spinal canal, which the spinal cord runs through to transmit nerve signals.

There are several different scenarios or conditions that may produce symptoms that would lead your physician to further investigate, and possibly recommend this surgery.

### **Stenosis causing Radicular Pain**

Spinal stenosis is the narrowing of the articular spaces within the spine; this may impinge on the nerves or the spinal cord. This is a degenerative process and may eventually lead to further changes on the spine over time. Radicular symptoms are pain, numbness, weakness, tingling, etc., that radiate along a specific nerve root/dermatome to other parts of the body outside of the spine.

In some instances, long-standing stenosis or arthritic changes in the cervical spine can diminish the space available for the spinal cord and begin to compress it. This compression of the spinal cord causes changes in the cord itself, and is called myelopathy. Myelopathy affects the entire spinal cord and usually occurs in the elderly because it takes time to develop. Symptoms may include weakness, increased tendon reflexes, loss of coordination, and loss of balance.

Surgical correction of these problems may include a decompression (shaving bone away to create more space around the nerve). Surgery may be performed through an anterior (front of the neck) or posterior (behind your neck) incision, depending on your diagnosis. In some cases, you may require a fusion as well.

### **Disc Herniation**

Herniation of the intervertebral disc may be due to an acute traumatic incident. However, it is usually due to a degenerative process that creates a tear in the outer part of the disc called the annulus, causing it to impinge upon nerves, or the spinal cord itself. As the herniation becomes more of a chronic process, it causes increased narrowing, also known as stenosis. This in turn, may create instability in the vertebrae, causing them to slide against each other (spondylolisthesis). This movement can be very painful and if severe enough, requires surgical fusion to stabilize the area and relieve symptoms.

Surgical correction of a disc herniation requires a minimally invasive discectomy, or removal of the disc. Many times this is done in combination with a decompression/laminectomy in order to obtain the best results.

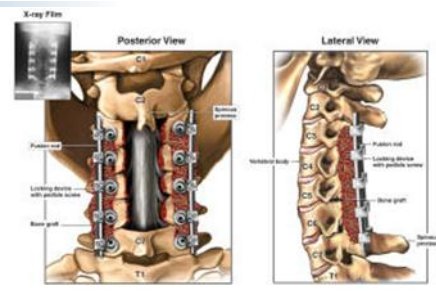
### **Nature of Procedure**

Your surgeon has determined that you have spinal cord compression in your cervical spine from degenerative changes (cervical spondylosis) that lead to narrowing (stenosis). This is to such a degree that it is causing abnormal motor function, walking, balance, and use of upper extremities. Pain and altered sensation in your neck, arms and/or legs may also occur. This procedure is designed to remove the pressure on the spinal cord to allow function to be maintained, and to set the stage for recovery of normal function.



This procedure is done with you lying on your belly (prone), and a head holder, which leaves small temporary indentations on the sides of your head, may be used.

We may use neurologic monitoring during surgery. The affected area of the cervical spine will be exposed and the lamina(e) removed through a laminectomy, which decompresses the spinal cord. A fusion is done next using either donor (allograft) or your own bone (auto graft) and rods with screws.



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### **Possible Complications and Instructions**

Surgery is undertaken to improve your condition. With all procedures, there are anticipated benefits and inherent risks. While your surgeon and team will do everything possible to minimize those risks, it is important for you to be aware of the more common risks.

Many of these risks are altered by preexisting patient conditions such as diabetes, obesity, smoking, vascular disease, etc. You may have undergone preoperative medical evaluation to limit the effect of these conditions. The potential risks include, but are not limited to complications associated with having anesthesia (for example, reaction to medications, and difficulty with your airway). Your anesthesia provider will be able to give you further information regarding this matter.

The more common complications following any surgical procedure are urinary tract infections, atelectasis (collapsed airspaces in the lungs), pneumonia and wound infection or bleeding. Such complications may require surgical interventions.

Less frequent, but more serious complications include thrombosis or blood clots in the blood vessels of the arms, legs, or pelvis, which may lead to pulmonary embolus (clot to the lungs). Other such complications include blood loss (which may require transfusion of blood products), heart attack, stroke, or even death.

The risks of the surgery may include damage or irritation to the nerves that may be temporary or permanent. This may cause numbness, weakness, or pain in the involved arm or leg.

There is also a possibility of paralysis, loss of bowel or bladder function, sexual dysfunction, deep infections requiring chronic antibiotic therapy, meningitis, stroke, blindness, chronic pain and additional surgery.

You should be aware that surgery has no assurances and individual results are variable. Your participation with the post-operative instructions and your current overall health does influence the outcome of surgery. Certainly, your surgical team will try their best to get the most optimal result for you.

### **Some of the risks more specific to your surgical plan include:**

Some of the risks of surgery near the spinal nerves include damage to the covering of the spinal nerves, which may cause a leak of spinal fluid. This may require repair, additional days of bed rest, or revision surgery. Scar tissue can form around/within the nerves, which may be painful and may require further treatment.

Bone graft is used to accomplish a fusion. This bone can come from a donor, or it can come from the patient. Donor bone goes through a rigorous process of screening and sterilization and risk of disease transmission is extremely low. If your bone is being used, you can expect to have some numbness and pain over the area where the bone will be harvested. Pain from the donor site is expected, but usually subsides with time.

Bone morphogenic protein is a protein which is sometimes used to help the donor bone in the fusion process. While this protein has been extensively tested, there has been some controversy around its use. Other potential side effects can occur, which you should discuss with your surgeon if you are receiving bone morphogenic protein.

There is also a risk that your bones may not fuse or heal completely. If this occurs, additional surgery may be required. There is also a low chance of injury to nerves or soft tissues from the hardware, which may require revision surgery.

Difficulty with swallowing is expected after surgery, which usually resolves with time. A short period of a soft diet is usually helpful. The need for further treatment or a feeding tube is extremely rare.

Weakness in the shoulders and arms may occur due to swelling and stretch of the nerves as your spinal cord expands after surgery. This may occur a few days after surgery. Unfortunately, wound complications are more common and tenderness at the sites where the pin holder is used against your skull may occur.

Feel free to contact our office if you feel you are experiencing any of these complications.

### **Preparing for Surgery**

#### **Medical Evaluation**

In preparing for your spine surgery, we may ask you to have a complete physical examination done by your primary care doctor before your surgical procedure. This is necessary to assess your health and identify any conditions that can interfere with your surgery or recovery. We may need additional clearances if you also receive medical care from a specialist like a cardiologist or urologist.

#### **Tests**

Several tests may be needed to help plan your surgery: blood and urine samples may be tested. An electrocardiogram (EKG) and chest x-rays (radiographs) may be obtained, along with anything else that your primary care provider deems necessary in order to assure you are safe to undergo surgery.

#### **Medications**

Tell your orthopedic surgeon about the medications you are taking. Your orthopedist or your primary care doctor will advise you which medications you should stop or can continue taking before surgery.

#### **Weight Loss**

If you are overweight, your doctor may ask you to lose some weight before surgery to minimize the stress on your body and possibly decrease the risks of surgery.

#### **Dental Evaluation**

Although infections after spine surgery are not common, an infection can occur if bacteria enter your bloodstream. Because bacteria can enter the bloodstream during dental procedures, you should consider getting treatment for significant dental diseases (including tooth extractions and periodontal work) before your spine surgery. Routine cleaning of your teeth should be delayed for several weeks after surgery.

#### **Urinary Evaluation**

Individuals with a history of recent or frequent urinary infections and older men with prostate disease should consider a urological evaluation before surgery.

### **Social Planning**

Although you will be able to walk either on your own or with a walker after surgery, you may need some help with tasks such as cooking, shopping, and laundry. If you live alone, a social worker, or a discharge planner at the hospital can help you make arrangements in advance to have someone assist you at your home. Depending on the extent of your surgery, a short stay in a rehab/recovery facility may be arranged.

### **What to Expect at Surgery**

You will arrive at the surgery registration area where the registration clerk will check you in. All of your insurance information will be verified and you will be escorted to the pre-operative area. You will change into a hospital gown and support stockings. All of your personal items will be marked and placed in a bag for safe keeping. They will be returned to you after surgery.

Your nurse will usually check your blood pressure, heart rate, temperature, respiratory rate, and oxygen level. An intravenous (IV) line will be placed to administer required fluids into your vein. Because you have been fasting, your body will require fluid supplementation through this IV line. It is also an access to administer medications during and after surgery.

You may find that you are asked the same questions throughout your stay. Please view this as a sign that every team member is being thorough and that your safety is of primary importance.

### **Pre-Operative**

The anesthesiologist will meet with you in the pre-operative area. He/she will discuss anesthesia and answer any questions you may have. Before being transported to the operating room, your surgeon will mark your operative site.

### **Operating Room**

Once you have been prepared in the pre-operative area, you will be transported to the operating suite. Here, you will meet several people, all of whom play an important role in your surgery. The surgeon and staff will assure proper positioning of you for surgery after you have received your anesthesia. Prior to positioning, you may have a catheter placed, which will most likely be removed after the surgery.

There will be a designated area for family and friends to wait while you are having surgery. A member of our healthcare team will be available to keep your family and friends updated on your progress. Your surgeon will contact them shortly after the surgery has been completed.

After your surgery has been completed, you will be transported to the post-anesthesia care unit (PACU).

### **Post Anesthesia Care Unit: PACU**

Here, the nursing personnel will place you on monitors to follow your blood pressure, heart rate, oxygen level, alertness, and will check your pain level. An important part of the PACU is to ensure that you are comfortable and stable after surgery. Pain medications will be administered as needed through your IV line. Often patients are nauseated after surgery and your nurse can give you medications for this. Oxygen will be administered through a facemask upon arrival and will be removed as you become more alert. Warm blankets are available to keep you warm and comfortable.

Once you are stable, and your nurse feels you are ready to leave the PACU, you will be taken to your hospital room. Your family will be notified and can then join you in your room.

### **Pain Management**

After surgery, it is normal to have pain and discomfort. You may be asked to rate your pain on a scale of 1-10, with 10 being the worst pain that you could imagine experiencing. It is recommended to ask for pain medication when your pain reaches a level 3-5 on the pain scale. This will ensure that your pain will be managed proactively. Your nurse and therapist will work with you to ensure that your pain medication schedule is well-coordinated. If your pain is not being relieved with the prescribed medication, your nurse will inform your surgeon. While in the hospital, you will have both IV and oral pain medications ordered and available to you. Ideally, we would like you to transition to oral pain medications by the day after surgery.

### **Therapy**

Therapy is an important part of your hospital stay and vital to your overall success after surgery. The physical therapy staff will work with you twice a day starting the evening of surgery. They will assist you with general mobility, walking and improving your strength and overall condition. If surgery is uncomplicated, you are encouraged to begin walking as soon as possible.

### **Care After Surgery**

After surgery you will be awakened and taken to either the recovery room (PACU) or the intensive care unit (ICU) depending on what both your surgeon and the anesthesiologist decide. When you are stable and your pain controlled, you can be discharged home. Certain patients may be discharged to rehab center to recover further before they eventually go home.

The drain placed in the operating room to collect excessive drainage will be removed postoperatively when it is safe. You may wear a surgical collar if your surgeon orders one for you, and the length of wear will be discussed between you and your surgeon.

You may shower on the third day after surgery as long as the wound is not draining. You should keep the incision clean and dry.

### **Physical Therapy and Activity**

You will be encouraged to walk often, being careful not to do any excessive bending, lifting, or twisting. For specific instructions, speak to your surgeon.

### **Ice**

Ice therapy may continue to provide comfort, decrease swelling and help with pain control for up to two weeks following surgery. Be sure to place a towel between the skin and the ice bag. Ice the area for 20 minutes or less to prevent frostbite.

### **Blood Clot Prevention**

After an orthopedic surgery, patients are at an increased risk for developing blood clots or deep venous thrombosis (DVT). Upon discharge you will be given a specific regimen that may include aspirin or prescription blood thinners. It is important to follow the instructions exactly and attend all scheduled follow up appointments. You should wear the compression stockings (TED hose) for 3 weeks, or as directed. Staying active as reasonably possible will also decrease your chances of forming a blood clot and improves your overall health as well. Let pain be your guide when deciding on what activities you can participate in.

***Symptoms of deep venous thrombosis or pulmonary embolism may include*** swelling or tenderness in the calves, legs or arms, shortness of breath, increased heart rate or palpitations, or chest pain. If you experience any of these symptoms, notify your surgeon and go to an emergency room.



### Wound Care

You have a surgical wound that requires daily attention and monitoring. Your healthcare team will instruct you about how to care for your wound before you leave the hospital. Please keep your incision clean and dry at all times. Do not immerse your incision in water. This includes pools, hot tubs, lakes, and bath water. You may shower on the third day after surgery as long as your wound is not draining.

Do not apply any lotions, creams or ointments unless prescribed by your surgeon. Your healed wound is new skin and should be protected from the sun with sun block especially in the year following surgery. Monitor your incision daily for any signs of infection. Some swelling and redness is normal, but if there is an increase or if you develop any of the symptoms below notify your surgeon.

**Symptoms of a wound infection may include** redness, drainage, swelling, warmth at/around the incision site or if you experience chills, shaking, an increase in pain or a fever over 101° orally. If you experience any of these symptoms notify your surgeon immediately.

A follow-up appointment will have already been scheduled for you 10-14 days following surgery for an incision check and removal of any sutures.

### Preventing Infection

Following your surgery, antibiotics should be taken before any dental or invasive procedure (i.e. dental cleaning, oral surgery, bladder scopes, urinary catheterizations, colonoscopy, etc.). Your surgeon will give you exact instructions by your surgeon after surgery. Please feel free to contact our office with any questions.

**Symptoms of possible infection are** persistent fever (higher than 101° orally), shaking, chills, increased redness/tenderness/pain at surgical site.

### Diet

Some loss of appetite following surgery is common. Make sure you are eating a balanced diet rich in protein to promote muscle healing and strength. It may help to eat smaller meals more frequently and drink plenty of liquids. If you cannot manage solid foods, try a nutritional meal replacement drink. If you are still experiencing problems with your appetite after one week, call your surgeon. Some surgeries may require an altered diet for a short period of time after. Your healthcare team will assess your needs and provide education regarding specific recommendations.

### Medications

Resuming your home medications will be determined by your physician. Please follow up with your primary care physician to ensure you are back on your prior medication regimen.

### Pain Medications

After your surgery, pain can be expected. You should have received a prescription for your home pain medications at your pre-operative visit in the office. With chronic narcotic use, there come risks and side effects. The most common side effect is constipation. You should begin taking a stool softener 1 week prior to surgery.

Other side effects may include nausea/vomiting, lightheadedness, confusion, sedation, and urinary retention. Another concern is dependence. Patients should treat their pain only as needed with these medications and wean off the narcotics in the first few weeks following surgery.



## Patient Education Posterior Cervical Decompression and Fusion

If you require a refill on your narcotic pain medication, please notify your surgeon early. Federal law prohibits the renewal or refill of most narcotic pain medications by phone, therefore requiring a written prescription to be picked up in the office or mailed to your home. Please allow sufficient time for your surgeon to complete a new prescription. Narcotic pain medications can NOT be renewed after hours or on the weekends. If you have questions regarding your prescriptions, pain, or find that your pain is not relieved by your prescription medication, please notify your surgeon.

### Questions

The CORE Institute is dedicated to your outcome. If any questions or concerns arise, please call The CORE Institute at 1.866.974.2673.