VB SPINE

Patient Guide to

Cervical Laminectomy and Fusion

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About the Cervical Spine

Your spine is made up of 33 bones called **vertebrae**. The vertebrae are positioned one on top of another from the base of the skull to the pelvis.

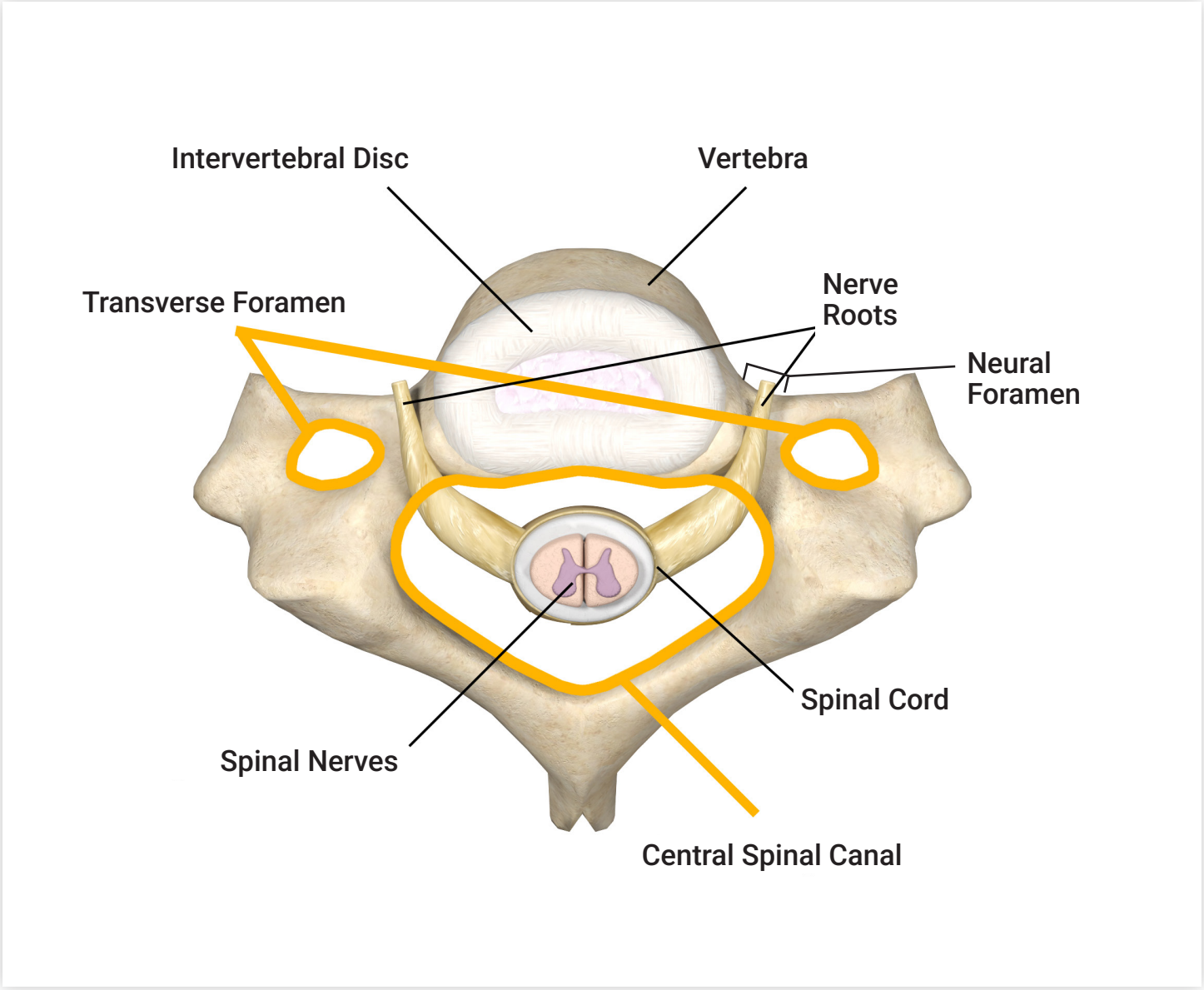

Figure 1: Cervical Vertebra

A shock-absorbing structure called an **intervertebral disc** sits between each vertebrae, and each spinal segment (defined as two vertebrae separated by one intervertebral disc) is connected by two small moving surfaces called **facet joints**.

Together, the vertebrae and discs form the spinal column. The spinal column supports the weight of the head and upper body, serves as an attachment point for muscles and ligaments allowing you to perform daily activities, and most importantly, protects the spinal cord.

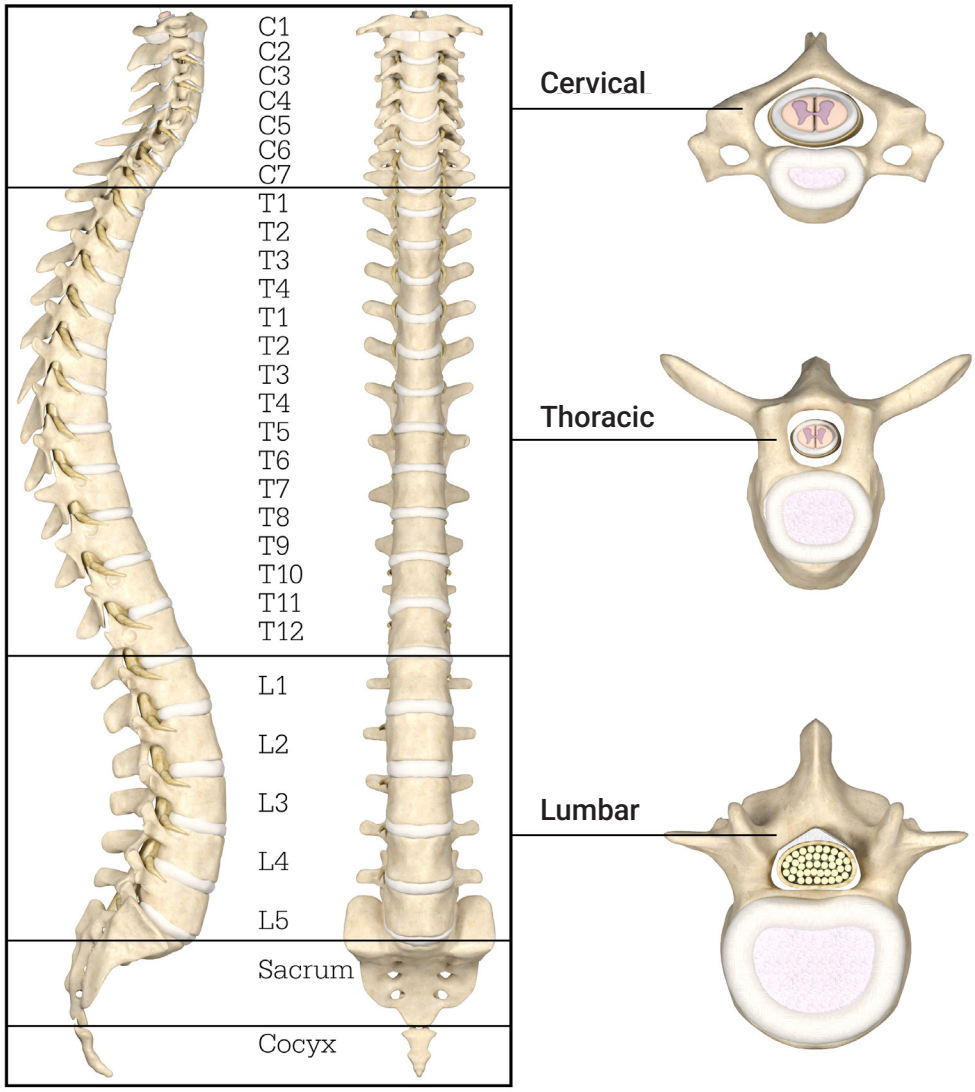

Figure 2: Spinal Column

The top seven vertebrae make up the neck (or cervical) region of the spine. When the bones or discs in the neck become diseased or injured, it can affect your ability to move and function normally.

What Are Some Possible Reasons for My Pain?

Degenerative Disc Disease

Degenerative disc disease (DDD) is the progressive breakdown of one or more of the **intervertebral discs** in your spine that can occur due to normal aging. Injury, daily wear and tear, and genetics can also contribute to this condition. Cervical disc degeneration consists of the breakdown of a cervical disc, which may then become narrowed or may **herniate**. Additional degenerative changes that may accompany DDD include thickened ligaments and/or the development of **bone spurs**.

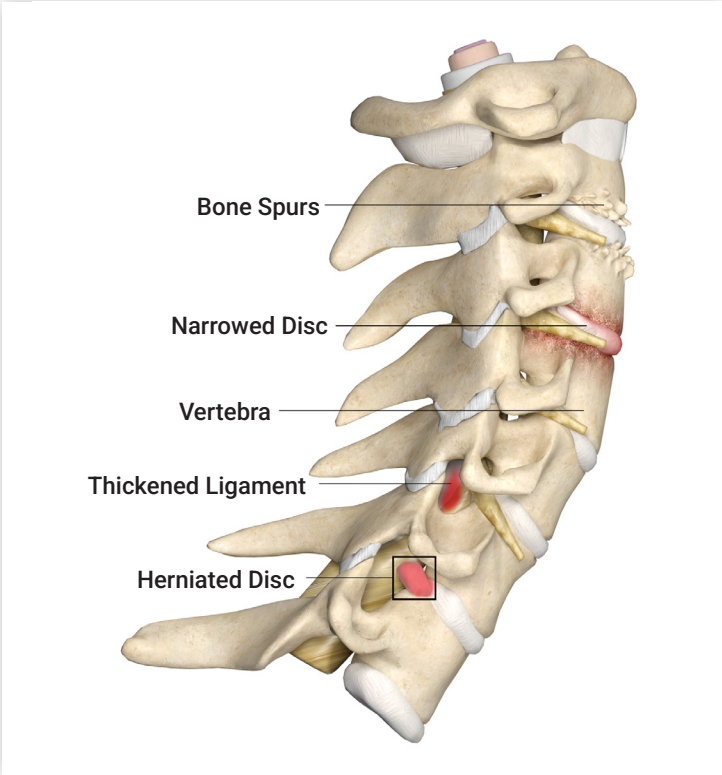

Figure 3: Degenerative Disc Disease

Cervical Spondylosis

Cervical spondylosis, or arthritis of the neck, is the medical term for age-related, wear-and-tear changes to the joints of the neck that can occur over a lifetime. Just like a hip or knee joint, the **facet joints**, or joints between each level of the spine, can develop arthritis from the wear and tear they endure as you get older. If the cartilage that protects these joints wears out, bone-on-bone contact can develop, which may result in the formation of **bone spurs**. Over time, bone spurs can narrow the space for the spinal cord and nerves. In most cases, cervical spondylosis responds well to conservative treatment that may include medication and physical therapy.

Herniated Disc

A **herniated disc** occurs when a small portion of an **intervertebral disc** shifts to an abnormal location, putting pressure on the spinal cord and/or nerves. Small herniations are sometimes called bulges or protrusions. In general, pressure on a spinal nerve can cause pain or discomfort in the neck or in various locations along one or both arms, frequently down to the hand. The pain or discomfort may feel like shooting pains, burning pains, weakness, and/or numbness.

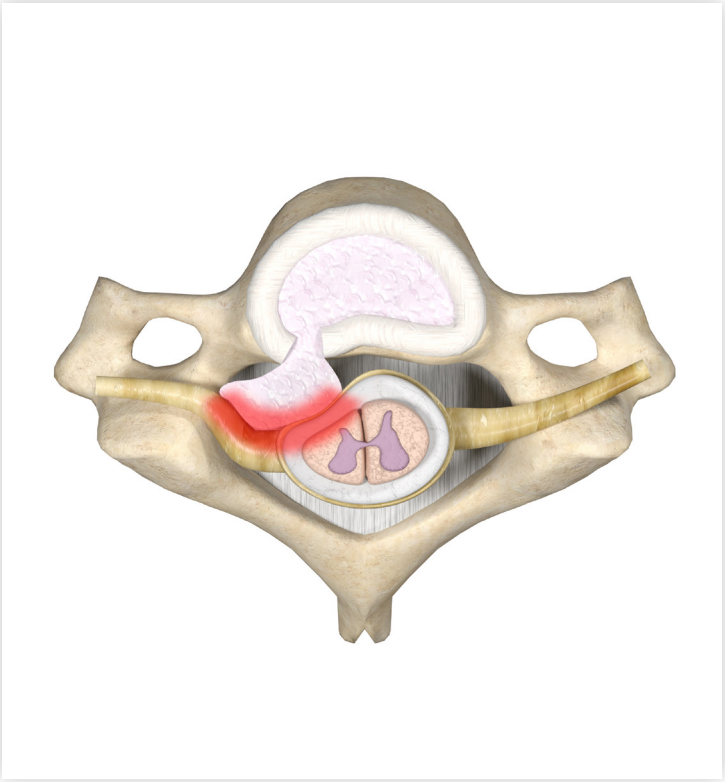

Figure 4: Herniated disc causing stenosis

Cervical Spinal Stenosis

Spinal stenosis is a narrowing of the space through which the spinal cord and/or nerves pass. Stenosis can affect either the **spinal canal** – the area of the cervical spine which contains the spinal cord, or the **neural foramen** – the openings through which individual nerve roots pass on their way to the arms. When either of these spaces is compressed, the nerves may begin to function abnormally, which may cause neck pain, weakness in the arms, or numbness and/or tingling in the arms. Rarely, a large herniated disc can cause spinal cord dysfunction including loss of fine motor skills, difficulty with walking or balance, and/or loss of bowel or bladder control.[1]

What are Some of My Treatment Options?

Physicians may utilize anti-inflammatory and/or pain medications, bracing, physical therapy or spinal epidural injections to treat cervical spine symptoms. Surgery may be considered for patients whose symptoms do not improve, but usually only if they have associated neurological symptoms or deformity of the spine.

What Is a Cervical Laminectomy and Fusion?

A cervical **laminectomy and fusion** is performed through an incision on the back of your neck. This procedure involves fully or partially removing pieces of bone called **spinous process** and **laminae** that surround the spinal cord and/or nerves. This is done to enlarge the space for and to help relieve pressure on the spinal cord and/or nerves.

Your surgeon will then perform a **spinal fusion** in order to help stabilize the spine. This procedure may include the placement of stabilization devices such as metal screws and rods to help hold the spinal bones (**vertebrae**) together. Your surgeon will also place **natural** or synthetic **bone material** to assist in the healing process.

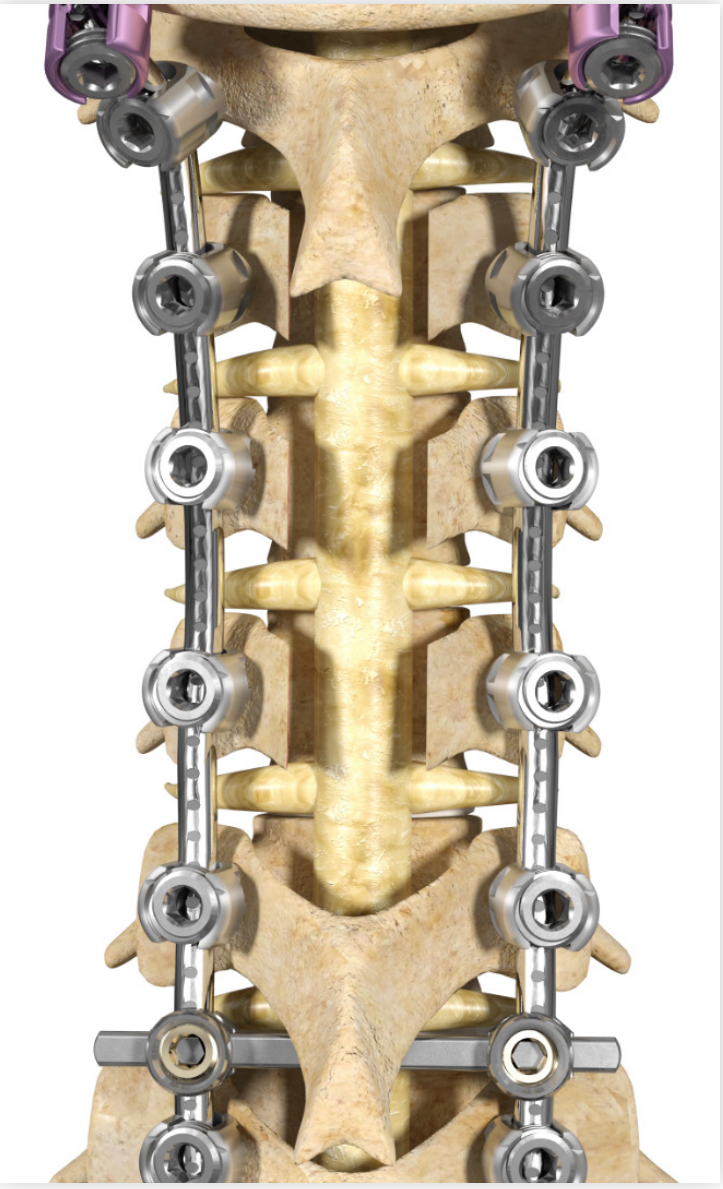

Figure 5: Cervical laminectomy and fusion with instrumentation

How Should I Prepare for Surgery?

Start now. Take care of yourself. Preparing for spine surgery begins a few weeks before the actual surgery. The checklist below outlines some common tasks that your surgeon may ask you to complete in the weeks prior to your surgery date. Check with your surgeon to discuss your specific pre-surgery instructions and risks.

- Complete all preadmission testing and evaluations, as instructed by your doctor. Ask your surgeon if or when to stop your routine medications.
- Most patients will be asked to walk around following surgery. Be sure to pack safe, slip-on shoes, and shorts or a robe for walking the halls of the hospital unit. You may also want to pack a button up shirt and pants that are easy to take on and off, such as sweat pants.
- Arrange for transportation home. You may travel home from the hospital by car, either reclining in the front passenger seat or lying down in the back seat.
- Identify a person who will be able to help you with you basic activities of daily living, shopping and other chores. You may consider planning to have a friend or relative stay with you for a few days.
- Choose and talk to a physical therapist to learn some important activities for after surgery.

What Typically Happens During Surgery?

1. Incision and Bone Removal

Your surgeon will make an incision along the midline at the back of the neck. After exposing the spine, he/she will use surgical instruments to remove bones called the **spinous process** and the **lamina**, as well as any bone spurs, from the affected vertebrae. Another variation of this step involves using a motorized instrument to cut a trough through the lamina on both sides of the vertebra and remove the lamina and spinous process as a single piece.

2. Preparation for Fusion

A motorized instrument called a burr is used to remove the top layer of the spine joints at the sides of the vertebrae to prepare a site for fusing the **vertebrae**. The **fusion** is intended to stabilize the spine where bone was removed.

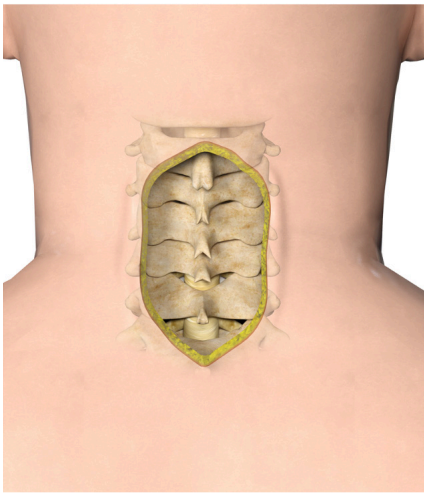

Figure 6a: Exposure of cervical spine

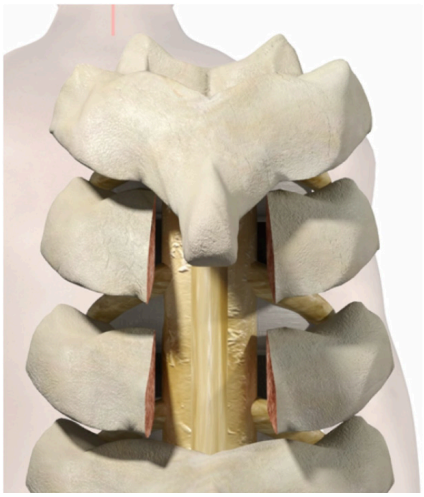

Figure 6b: Spinous process and lamina removed

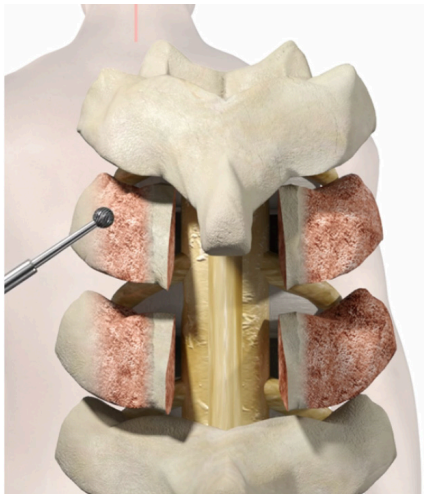

Figure 6c: A burr is used to remove the top layer of the spine joints to prepare for fusion

3. Bone Material Placement

Your surgeon will place bone material, which can be your own bone that was removed earlier in the procedure, processed **donor bone** from a bone bank, or synthetic bone material. Bone material is placed along the prepared site where the top layer of bone was removed with the intention that it will eventually grow in place, fusing the spinal bones together and helping to provide additional stability in the weeks and months following surgery.

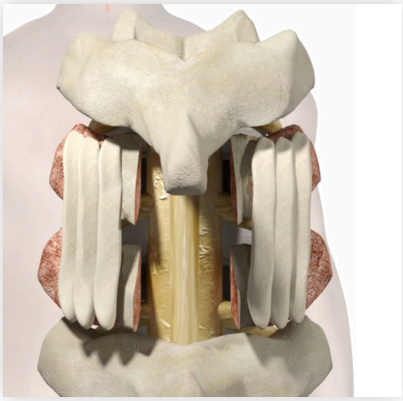

Figure 7: Bone material placed

4. Stabilization

Your surgeon may also choose to use devices such as metal screws and rods to help add stability. A drill is used to make holes in the bones connecting the back of the vertebrae to the vertebral bodies in the front of the spine. These bones are called lateral masses, and the instrumentation placed into them in this procedure are called lateral mass screws. Rods are inserted and locked into the heads of the screws on both sides to connect them.

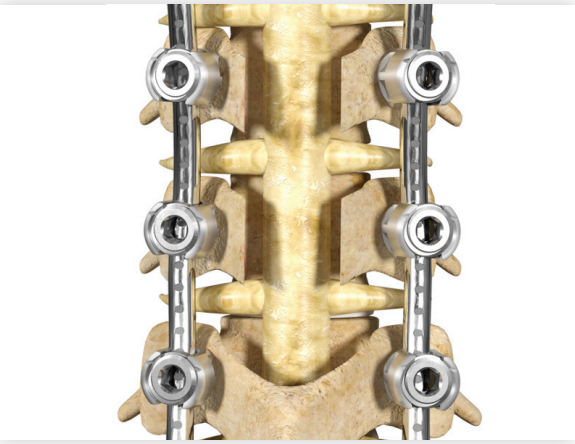

Figure 8: Metal screws and rods for stability

5. Surgical Closure

Your surgeon will close the incision and dress it with a wound covering at the conclusion of the surgery. Some patients require a cervical collar, or neck brace, for a short period of time after surgery. As with any surgery, spinal surgery carries certain risks. Your surgeon will explain all the possible complications of the surgery, as well as side effects.

What Implants Could Be Used In My Surgery?

Screws And Rods

Figure 9: Implants typically used in cervical laminectomy and fusion procedures

What Does Recovery Look Like?

Recovering from Cervical Spine Surgery

In the days following your procedure, your surgeon, nurses and physical therapists will closely monitor your condition and progress. Although the recovery process varies for each patient, here is what you might expect in the days following surgery:

- After neck surgery, some patients are able to go home the same day or the next day, so most of the recovery time is spent at home. You may be asked to walk the day of or day after your surgery.
- It may be easier to wear shirts that have zippers or button up the front, rather than those that go on over the head during the initial recovery period.
- Your doctor may prescribe pain medication. Driving must be avoided while taking certain medications or muscle relaxants. Speak to your doctor about any medications he or she prescribes for you.
- Having a sore throat and/or difficulty swallowing for the first few days is common after cervical spine surgery. The medical term for this is dysphagia. While the sore throat usually goes away within a week, difficulty swallowing may linger. Eating soft foods is recommended and if the pain persists, throat sprays may be helpful. Be sure to call your doctor to report or discuss any concerns you have.

- All patients are advised to move carefully. You may be asked to avoid certain activities like turning the head sharply, lifting anything heavy, or bending over for a specified time following surgery. Your surgeon will tell you when it is safe to resume normal activities.
- Some patients may be required to wear a neck brace to avoid unsafe movement and to provide stability. If this happens, you will be shown how to put the brace on and take it off. You also will be given instructions on when to wear it and for how long. Driving must be avoided while wearing a neck brace.
- Smoking or any type of nicotine intake increases the risk of complications and may interfere with the bone-healing process required for a successful fusion. Speak with your doctor to better understand the risks associated with smoking or nicotine intake.
- Physical therapy can help you return to normal activity during the recovery period. The amount of physical therapy that is needed will be determined for you based on your individual goals and progress. In addition to offering guidance on safe ways to perform everyday tasks at home, physical therapists can also suggest ways to protect the neck before returning to work or other activities. Work with your physical therapist to determine what activities are right for you.

Frequently Asked Questions

These FAQs are not a substitute for medical advice from your doctor. Please be sure to speak with your doctor about any questions regarding your specific symptoms, diagnosis and treatment options.

Q: Can I shower after surgery?

A: Depending on the size and location of your surgical incision and what kind of dressing is applied to the surgical site, you may have special instructions for showering. Your surgeon may ask you to wait to shower after surgery for anywhere from one to three days. Don't soak in water (e.g., bathtubs, swimming pools) until your doctor says it's okay. As always, ask your doctor what is best for you.

Q: Will I have a scar?

A: Yes. Due to the nature of surgery in general, you will have a scar. Your surgeon may recommend a topical treatment to help reduce scar formation.

Q: When can I drive?

A: It is typical for surgeons to advise that patients only return to driving once they are no longer taking pain medication(s) and once they feel comfortable turning the head in all directions. Please ask your doctor prior to driving.

Q: When will I be able to return to work?

A: This will depend on the nature of your job. People with labor intensive jobs may take longer to get back to work, while people with desk jobs may be able to return sooner. The amount of time can range anywhere from two to twelve weeks. Ask your doctor about the best plan for you to get back to work.

Q: Can I travel?

A: In general, your surgeon will recommend waiting until you feel comfortable enough to travel. As always, ask your doctor what is best for you.

Q: How long will I have restricted activities?

A: Many surgeons recommend that their patients wait twelve weeks before returning to normal activities. Please ask your doctor when you can resume normal activities, as every person is different.

Glossary

Allograft: tissue graft taken from another body

Autograft: tissue graft taken from a patient's own body

Bone spurs: bony projections that can develop as a result of the natural aging process

Cervical spondylosis: medical term for age-related changes to the cervical spine that occur over a lifetime

Degenerative disc disease: the progressive breakdown of the intervertebral discs throughout the spine that can occur as we age

Donor bone: bone graft that comes from a donor and is referred to as allograft bone. Allograft bone usually comes from bone banks that harvest the bone from cadavers

Facet joints: surfaces, or joints between the spinal bones that allow for motion

Herniated disc: the shift of an intervertebral disc into an abnormal position

Intervertebral disc: soft structure found between each of the spinal bones that acts as a shock absorber

Lamina(e): bone(s) at the back of the spine protecting the spinal canal

Laminectomy: surgical removal of the entire lamina, a bone at the back of the spine

Natural bone material: bone material that can come either from a patient's own body (autograft) or be donated (see donor bone) from a bone bank after being harvested from a cadaver (allograft)

Neural foramen: opening through which the spinal nerves pass on their way from the spinal canal to the arms or legs

Spinal canal: an opening that runs successively through each of the vertebrae from the neck to the pelvis and contains the spinal cord

Spinal fusion: permanent connection of two or more vertebrae in the spine, eliminating motion between them. Spinal fusion involves techniques that are designed to mimic the normal healing process of broken bones

Spinous process: bony projection protruding off the middle of the back of each vertebra where the laminae from either side join together; provides the point of attachment for muscles and ligaments of the spine

Spinal stenosis: a narrowing of the space through which the spinal nerves pass

Thecal sac: soft tubular structure that contains the spinal nerves

Vertebra(e): spinal bones

References:

1. Choi YS. Pathophysiology of degenerative disc disease. Asian Spine J 2009;3:39-44.
2. Kelly JC, Groarke PJ, Butler JS, Poynton AR, O'Byrne JM. The natural history and clinical syndromes of degenerative cervical spondylosis. Adv Orthop. 2012.
3. Meyer F, Borm W, Thome C. Degenerative Cervical Spinal Stenosis: Current Strategies in Diagnosis and Treatment. Deutsches Arzteblatt International. 2008. 105(20): 366-372.

In general, surgical treatment options presented by your surgeon are aimed at relieving pressure on nerve roots in an attempt to address pain.

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The information presented is for educational purposes only. VB Spine is not dispensing medical advice. Please speak to your doctor to decide if spinal surgery is right for you. Only your doctor can make the medical judgment regarding which products and treatments are right for your own individual condition. Spinal surgery carries certain risks. Your surgeon will explain all the possible complications of the surgery, as well as side effects. Each spinal surgery patient will experience a different post-operative activity level, depending on his/her own individual clinical factors. Your doctor will help counsel about how to best maintain your activities in order to recover properly from your surgery. Such activities include not engaging in high-impact activities that could de-stabilize any instrumentation that may have been implanted.

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