



SILVER SPINE & NEUROLOGICAL CENTER

ADULT BRAIN AND SPINE SURGERY



M. Viktor Silver, MD, FACS, FRCS, FAANS

A double-board certified neurosurgeon by the American Board of Neurological Surgery and by the Royal College of Physicians and Surgeons of Canada, Dr. M. Viktor Silver's passion is caring for patients with complex spinal cases. He believes in treating each patient as he would his own family members utilizing his extensive training and cutting-edge technology to deliver ideal results.

A highly versatile surgeon who graduated from one of the largest neurosurgical training centers in North America only to further specialize in the treatment of spine disorders, Dr. Silver is widely recognized as an expert on the latest techniques in spinal surgery. He's worked on both private and academic neurosurgery, working at the University of Florida Jacksonville as director and founder of the UF Complex Spine Surgery Center and as chief of neurosurgery, helping to establish a level-II trauma center in South Florida affiliated with the University of South Florida and Florida State University. In addition, he's a sought after teacher, training surgeons, residents, and fellows on the latest techniques in spine surgery.

Growing up, Dr. Silver's work ethic was readily apparent from a young age. During his formative years, he worked helping his father build the family business. "I was his right hand," says Dr. Silver. "I worked in the morning and afternoon and studied at night." It was Dr. Silver's mother, noting his proclivity for excellence, who suggested the field of medicine. "That was when I decided to become a doctor," exclaims Dr. Silver.

He approached medicine, as is his style, methodically and with the goal of getting the finest education possible to help him achieve his dream of being a doctor.

Initially, Dr. Silver was planning on

DR. M. VIKTOR SILVER

VAST ACADEMIC KNOWLEDGE AND EXTENSIVE HANDS-ON EXPERIENCE DEFINE THE SURGEON AT THE HELM OF SILVER SPINE & NEUROLOGICAL CENTER.

becoming a surgeon specializing in epilepsy. It was during his many extra electives in general surgery and trauma that inspired him to combine neurology with surgery. It was this decision that led him to an exchange opportunity to go to Germany after graduating from medical school.

"During my training, I fell in love with the spine," says Dr. Silver, whose time at The University of Tübingen, School of Medicine, Katharinen Hospital in Stuttgart, Germany, led to a general surgery internship at McGill University and a neurosurgery residency at the University of Toronto, both in Canada. After that, Dr. Silver completed a Spinal Fellowship for the management of complex spinal disorders and minimally invasive spine surgery at the Medical College of Wisconsin.

After 14 years in practice with complex cases and four years working in the Texoma area, Dr. Silver followed in his father's entrepreneurial footsteps by opening up his own center, Silver Spine & Neurological Center.

"Throughout my life, I've always developed a business for somebody else. One of my initial jobs was at the University of Florida, where I developed the Comprehensive Spine Center for the University of Florida. Following that, I helped develop a trauma center

and surgical program..." explains Dr. Silver, who felt it was time to develop his own institute in the Lone Star State.

He chose it for a number of reasons. "I think Texas is one of the greatest states in the country," says Dr. Silver. "It's a very fertile ground for hardworking people," he says.



Armed with his vast academic knowledge and extensive hands-on experience, he opened Silver Spine & Neurological Center to meet the needs of the Texas community he now calls home. "My goal is to apply the extensive experience and academic training that I have and bring the highest level of care to the communities of Texoma and Collin counties with cutting-edge technologies," says Dr. Silver.

He firmly believes that his patients deserve an accurate diagnosis and realistic treatment and recovery plans.

"I take a very conservative route, as if I were seeing patients at the university. I give them the non-surgical options first," explains Dr. Silver. "I treat patients in a comprehensive way, coordinating the care with pain management doctors, chiropractors, and physical therapy clinics. Every patient goes through a step-by-step

"I'm able to build a trust bond with patients that is unique, while delivering the best surgical results."
~Dr. Silver.

academic approach. It is only when the non-surgical options fail do they become surgical candidates."

These are but a few of Dr. Silver's numerous success stories:

Recently, Dr. Silver handled the case of a 65-year-old female who'd been to see a number of neurosurgeons and spinal surgeons. "She had a relatively simple problem of a lumbar disc herniation, which was never really diagnosed properly," describes Dr. Silver. After seeing the patient in his office and personally analyzing her MRI scans, he was able to correlate that with the patient's clinical symptoms.

"I was able to diagnose a symptomatic disc herniation that was overlooked. We did a very successful outpatient surgery that had a complete resolution of her pain," says Dr. Silver.

"I had another case, a very complex spinal case, where the patient was turned back by every spine surgeon and I was able to apply minimally invasive spinal techniques using the latest technologies and the patient had a complete resolution of the spinal pain," he details.

"I'm able to build a trust bond with patients that is unique, while delivering the best surgical results," describes Dr. Silver. "The primary objective is to understand the patient's symptoms and signs in the context of a comprehensive diagnosis, to then lay the groundwork for treatment."

Dr. Silver's patients benefit greatly from his approach and dedication to his craft.

Take, for instance, another one of Dr. Silver's cases where his efforts produced astounding results. This patient was a 70-year-old wheelchair-bound man with a large spinal tumor

that was causing him to become a paraplegic due to severe spinal cord pressure. Dr. Silver performed a complete resection of the tumor. The patient had a remarkable recovery and is now walking normally.

"The key to any business success is to employ the right people. If you're surrounded by talented people, it makes for a successful combination," says Dr. Silver. He has four dedicated employees, plus many talented nursing teams at the ready at the surrounding hospitals where he performs surgery.

"I have access to facilities that provide me with the very latest technologies and with the ability to monitor the activity of the spinal cord," says Dr. Silver, who approaches medicine with the "Do no harm" mantra. "Help patients as much as possible with an honest approach that considers non-surgical options first. That way, a trusting relationship develops with the patient and if no improvement is seen, only then do we do surgery and we do the right one with great results."

Dr. Silver has happily settled in the McKinney area with his wife, Vivian, and son, Matthew. Among the things he appreciates about the area is that it's a safe place to raise his son with a Christian upbringing. The family enjoys traveling and going hunting for deer, turkey, and upland bird hunting in Oklahoma and south Texas.



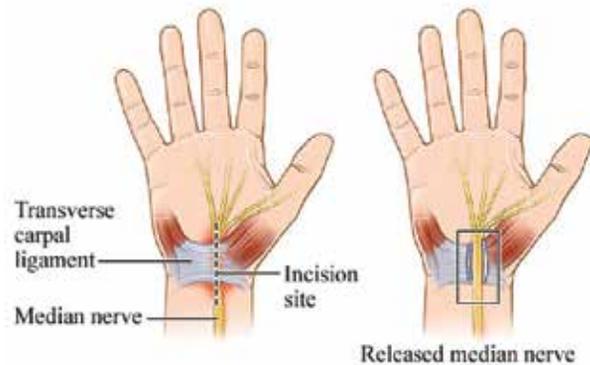
WHAT IS CARPAL TUNNEL SYNDROME?

By M. Victor Silver, MD, FRCSC, FACS, FAANS

Carpal tunnel syndrome occurs when the median nerve, which runs from the forearm into the hand, becomes pressed or squeezed at the wrist. The median nerve controls sensations to the palm side of the thumb and fingers (although not the little finger), as well as impulses to some small muscles in the hand that allow the fingers and thumb to move. The carpal tunnel - a narrow, rigid passageway of ligament and bones at the base of the hand - houses the median nerve and tendons. Sometimes, thickening from irritated tendons or other swelling narrows the tunnel and causes the median nerve to be compressed. The result may be pain, weakness, or numbness in the hand and wrist, radiating up the arm.

SURGERY

Carpal Tunnel Surgery is done under twilight anesthesia. The drugs cause amnesia, so it feels like one has been completely knocked out. Even though general anesthesia



is not administered, when the patient awakes they cannot remember any of the events that have taken place during the surgery. Through an incision on the wrist, the carpal ligament is severed to relieve the pressure on the median nerve - Hence, the phrase “Carpal Tunnel Release Surgery”.

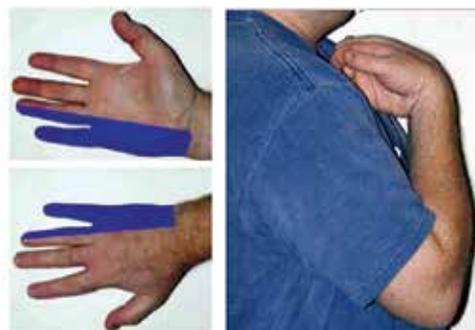


WHAT IS CUBITAL TUNNEL SYNDROME?

Cubital tunnel syndrome is a nerve injury that can result in moderate to severe pain and numbness in the elbow and ring and little fingers. It is a syndrome caused by repetitive stress injury that feels like you hit your funny bone. It is caused when the ulnar nerve in your arm is irritated, pinched or damaged, typically at the bony point on the elbow. If left untreated, it can result in extreme pain, surgery or an unusable hand.

SURGERY

The operation is designed to take pressure off the nerve, and sometimes to move the nerve to a position to reduce compression during common daily activities that include bending of the elbow. There are many operations for compression of the ulnar



Numbness and pain while sleeping or working with your elbows bent can lead to more pressure on the ulnar nerve in the ring and little fingers.

nerve at the elbow, ranging from simple decompression to moving the ulnar nerve to the front of the elbow and placing it beneath a muscle layer.



POST-OPERATIVE INSTRUCTIONS

CARPAL TUNNEL SURGERY

- Surgery as an outpatient.
 - Keep the hand elevated for 7 days on arm sling to prevent swelling.
 - Your sutures will be removed in 3 weeks, until then, DO NOT USE YOUR HAND NOT EVEN TO OPEN THE DOOR. The incision may open completely if you do so!
 - Keep the wound dry for 3 weeks.
 - Dressing changes will be done at the doctor's office – on the same day you leave the hospital, call to schedule an appointment to be seen in 3 days.
 - If there is worsening pain, numbness, weakness, and swelling of the hand or discharge or redness from the wound – GO TO THE NEAREST EMERGENCY DEPARTMENT.
 - The pain and numbness may take several weeks or months to subside after surgery and depending on the degree and duration of the symptoms, residual pain and numbness may be permanent.
 - Physical therapy may speed your recovery.
-

POST-OPERATIVE INSTRUCTIONS

CUBITAL TUNNEL ULNAR NERVE AT THE ELBOW SURGERY

- Surgery as an outpatient.
- Keep the hand elevated for 7 days on arm sling to prevent swelling.
- Your sutures will be removed in 10 days, until then, DO NOT USE YOUR ARM. The incision may open completely if you do so!
- Keep the wound dry until 4 to 5 days after the staples come out.
- Dressing changes will be done at the doctor's office or by home health agency– on the same day you leave the hospital, call for an appointment in 3 days.
- If there is worsening pain, numbness, weakness, and swelling of the hand or discharge or redness from the wound – GO TO THE NEAREST EMERGENCY DEPARTMENT.
- The pain and numbness may take several weeks or months to subside after surgery and depending on the degree and duration of the symptoms, residual pain and numbness may be permanent.
- Physical therapy may speed your recovery.

CERVICAL DISK FUSION SURGERY

By M. Victor Silver, MD, FRCSC, FACS, FAANS

During cervical disk surgery, all or part of the disc may be removed (**discectomy**). To reach the cervical spine, an incision may be made in the front (**anterior**) or the back (**posterior**) of your neck. With the anterior approach, the neck may be made more stable with a **fusion** (joining) of the vertebrae. With the posterior approach, bone may be removed to enable your surgeon to reach the disk.

THROUGH THE FRONT: ANTERIOR APPROACH

A horizontal or vertical incision (about 1 to 3 inches long) will be made on either side of your neck. To reach the disk, soft tissue is moved aside. All or part of the disk that is irritating the nerve is then removed. Your surgeon may remove bone spurs. The vertebrae may then be prepared for a fusion.

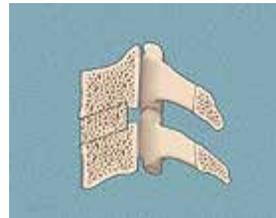
SPINAL FUSION: CERVICAL

Fusing vertebrae in the cervical curve may help ease neck and arm pain. Two or more vertebrae in your neck are fused. Cervical fusion is usually done through an incision in the front of the neck. It may sometimes be done through the back of the neck, or through both the front and back. The surgery generally takes from 1–3 hours for one disk to be fused and as more levels are fused the longer takes the operation – check with your doctor.

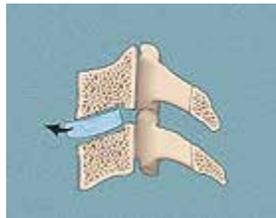
THE FUSION PROCEDURE

These steps apply to fusion from the front of the neck:

- The disk is removed from between the vertebrae.
- Bone graft is packed into the now-empty space between the vertebrae. In time, the graft and the bone around it will grow into a solid unit (FUSION).
- To help keep your spine steady and promote fusion, extra support (see below) may be used
- The incision is closed with sutures or staples.



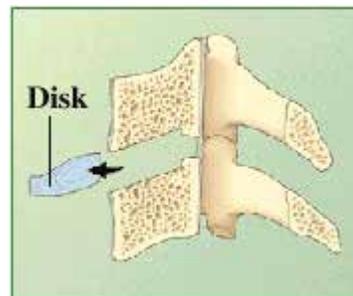
A bone graft is inserted to plug the opening and to allow bone fusion (bones become one solid unit aka FUSION).



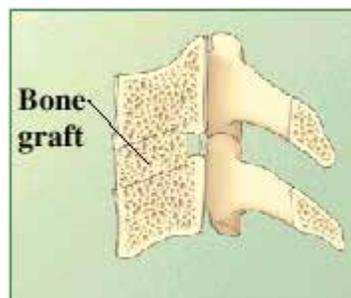
The disk is removed from between the vertebrae.



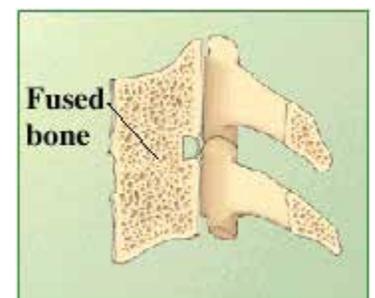
Cervical vertebrae



The disk between the vertebrae is removed.



Over a 3 to 4 months, the bone graft and vertebrae fuse into a solid unit.



Bone graft is packed into the now-empty space between the vertebrae.

CERVICAL DISC REPLACEMENT

Lowers the Risk of Future Surgery

By M. Viktor Silver, MD, FRCSC, FACS, FAANS

Your cervical spine is made up of the seven bones, called cervical vertebrae, stacked on top of each other in your neck area. The cervical disks are the cushions that lie between the cervical vertebrae and act as shock absorbers to allow your neck to move freely.

PROCEDURE OVERVIEW

Cervical disk replacement surgery involves removing a diseased cervical disk and replacing it with an artificial disk. It is done when the space between your vertebrae has become too narrow and part of your vertebrae or your cervical disk is pressing on your spinal cord or spinal nerves, causing you pain, numbness, or weakness. When these symptoms do not respond to nonsurgical types of treatment, disk surgery may be recommended.

Using an artificial disk to replace your natural cervical disk is a new type of treatment that has recently been approved by the FDA. In traditional cervical disk surgery, the diseased disk is removed and the cervical vertebrae above and below the disk may be fused together. Disk replacement surgery may have the advantage of allowing more movement and creating less stress on your remaining vertebrae than traditional cervical disk surgery, and decreasing the need for future surgery.

REASONS FOR THE PROCEDURE

By allowing normal movement at the disc, there is less wear and tear of the joints above and below. Disc replacement is a minimally invasive technique that reduces the need for additional surgery and it is best recommended for younger patients.



YOUR SYMPTOMS MAY INCLUDE:

- Neck pain
- Neck stiffness
- Headache
- Pain, weakness and tingling or “Pins and needles” or numbness that travels down into your shoulders or into your arms.
- The damaged disc may be irritating the Spinal cord (myelopathy) or nerve roots (radiculopathy). This can cause a loss of feeling, loss of movement, pain, weakness, or tingling down the arm and possibly into the hands.

Disc replacement surgery is often done with one night stay and with over 90% arm pain improvement.

DURING THE PROCEDURE

Just before the procedure starts you will have an intravenous line (IV) started so you can receive fluids and medications to make you relaxed and sleepy. This procedure is usually done under general anesthesia (you are asleep). A one- to two-inch incision (surgical cut) is made on the side or front of your neck. The important structures of the neck are carefully moved to the side until the surgeon can see the bones of the vertebrae and the cervical disk. Then, the cervical disk that is being replaced is removed followed by the artificial disk being placed into the empty disk space. The incision is closed using absorbable sutures (stitches) under the skin. The skin is then carefully closed with sutures that minimize any scarring.

AFTER THE PROCEDURE

Once you can drink normally, you will be able to start eating your normal diet. You’ll continue to take pain medication if you need it and you may be given a support collar to wear in the hospital. You’ll be encouraged to get out of bed and move around as soon as you can and may start physical therapy after a few weeks. You should be able to return to full activities by four to six weeks.



POST-OPERATIVE INSTRUCTIONS

CERVICAL FUSION OR DISC REPLACEMENT

PRECAUTIONS

1. Strictly NO bending of the neck, NO lifting anything heavier than 10 lbs and NO twisting.
2. Cervical braces are to be worn at all times unless otherwise ordered.
3. Activity level/limitations: Depending on the surgery, you may not have limitations on how long patients can be out of bed and will be encouraged to be out of bed for as long as reasonably tolerated.

AFTER SURGERY:

1. Dressings will be changed daily.
2. If a drain has been placed, it may be removed within the first three days of surgery.
3. After a fusion procedure has been performed a brace will be required for 6 weeks after cervical or neck surgery and for disc replacement for 2-3 weeks
4. Keep the wound dry after surgery until the staples or sutures are removed, usually in 10 days – CALL YOUR DOCTOR'S OFFICE AS SOON AS YOU LEAVE THE HOSPITAL TO SET UP AN APPOINTMENT.
5. The Neck brace is your best friend as it protects the surgery just done by preventing you from bending or twisting your Neck – USE YOUR BRACE AS INSTRUCTED BY YOUR DOCTOR.
6. Take only the pain killers provided by your physician and avoid over-the-counter medications, including Tylenol, Aleve, Advil, Ibuprofen, Motrin or Aspirin – ANTI-INFLAMMATORIES LIKE ADVIL, IBUPROFEN, NAPROXEN, NAPROSYN AND ALEVE CAN BLOCK THE BONE HEALING OR FUSION WHICH CAN PUT YOUR SURGERY AT MAJOR RISK.
7. NO SMOKING – like the anti-inflammatories, smoking can block the fusion – COMPLY WITH THE DOCTOR'S INSTRUCTIONS AND YOU WON'T NEED TO DO MORE SURGERY TO FIX YOUR PROBLEMS!
8. For pain refills after surgery, remember to call your doctor's office during regular hours and allow at least 24 hour to have your prescription refilled – PLAN IN ADVANCE, especially on Fridays.
9. Driving may not be possible when using the cervical brace in the beginning – TALK TO YOUR SURGEON!



SILVER SPINE &
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MINIMALLY INVASIVE MICRODISCECTOMY

By M. Viktor Silver, MD, FRCSC, FACS, FAANS

Overview and Indications

Microdiscectomy is performed for patients with a painful lumbar herniated disc often known as sciatica. Microdiscectomy is a very common surgery performed by spine surgeons. The operation consists of removing a portion of the intervertebral disc, the herniated or protruding portion that is compressing the spinal nerve root.

Today, many surgeons use a microscopic surgical approach with a small, minimally-invasive, one-inch incision to remove the disc herniation, allowing for a more rapid recovery with less blood loss, less pain and shorter hospital stay.

Surgical Technique

A 1-inch longitudinal incision is made in the midline of the low back, directly over the area of the herniated disc. Special retractors and an operating microscope are used to allow the surgeon to visualize the region of the spine, with minimal or no cutting of the adjacent muscles and soft-tissues.

A few millimeters of bone of the superior lamina may be removed to fully visualize the disc herniation. The nerve root and neurologic structures are protected, so that the herniated disc can be removed. Small dental-type instruments and biting/grasping instruments are used to remove the protruding disc material. All surrounding areas are also checked to ensure no additional disc fragments are remaining. The total surgery time is approximately 1 hour.

Post-Operative Care

Most patients are able to go home the same day or early the next day after surgery. Patients are instructed to avoid bending at the waist, lifting (more than five pounds), and twisting in the early postoperative period (first 2-4 weeks) to avoid a strain injury or recurrent disc injury.

Patients should try to avoid sitting in the same position for more than 30-45 minutes in the first few weeks after

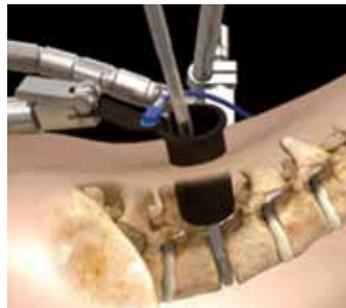
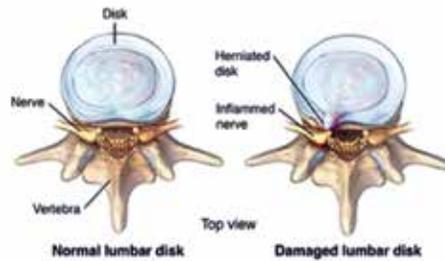


Figure 1 (middle, above): Minimally Invasive Tubular Retractor allowing for minimal muscle retraction with less pain, smaller incision and faster recovery times.

Figure 2 (above): One-inch incision: Inlet view of the surgeon's direct visualization of the spinal elements through microtubes allowing for ideal visualization without muscle retraction and injury.

surgery. After sitting for 30-45 minutes, patients should get up and stretch or walk for a little bit, then sit down again if desired.

Brace

Patients are generally not required or recommended to wear a back brace after surgery.

Shower/Bath

Patients can shower immediately after surgery, but should cover the incision area with a small bandage and tape, and try to avoid water hitting directly over the surgical area for 10 days. Patients should not take a bath until the wound has completely healed, which is usually around 2 weeks after surgery.

Driving

Patients may begin driving when the pain level has decreased to a mild level, which usually is between 2-10 days after surgery. Patients should not drive while taking pain medicines (narcotics). After patients feel comfortable with a short drive, they can begin driving longer distances alone.

Return to Work and Sports

Patients may return to light work duties as early as 1-2 weeks after surgery, depending on when the surgical pain has subsided.

Doctor's Visits and Follow-Up

Patients will return for a follow-up visit to see Dr. Silver approximately 8-10 days after surgery. The incision will be inspected. Patients will be given a prescription to begin physical therapy for back exercises, to start 3-4 weeks after the surgery. Medications will be refilled if necessary.

Results and Outcome Studies

The results of microdiscectomy surgery in the treatment of a painful, herniated disc are generally excellent but can vary according to the degree and duration of compression of the spinal nerves which can lead to a permanent nerve damage. However, most patients are noted to have a rapid improvement of their pain and return to normal function.



POST-OPERATIVE INSTRUCTIONS

LAMINECTOMY, LAMINOTOMY OR DISCECTOMY

After surgery, you can expect to feel some pain at first. To gain the best pain relief, answer honestly when asked how much you hurt. Expect health care providers to help you get up and moving. You'll also be shown how to clear your lungs and how to do breathing exercises.

CONTROLLING PAIN

At first, you may be given pain medications by IV or injection. Expect to feel some pain, even with the medications. This is normal. But if the medication does not reduce your pain, be sure to tell the nurse.

PCA PUTS YOU IN CONTROL

With PCA (patient-controlled analgesia), pain medication is sent through an IV line at the push of a button. To provide a steady level of pain relief, only you should push the button. For your safety, the pumps have special features to limit the amount of medication you receive.

GETTING UP AND MOVING

You may begin to walk within hours after surgery. This reduces some risks of surgery, such as blood clots. With an IV and a PCA pump in place, walking may be a little tricky. But don't worry. A health care provider will help you.

CLEARING YOUR LUNGS

Fluid can collect in the lungs after any surgery. To clear your lungs and prevent pneumonia, breathe deeply and cough. You should do this often—at least ten times each hour. A respiratory therapist or nurse may show you how to use an incentive spirometer. This machine can help you breathe in and out the right way.



PRECAUTIONS

1. Strictly NO bending, NO lifting anything heavier than 10 lbs and NO twisting your BACK.
2. Activity level/limitations: Depending on the surgery, you may not have limitations on how long patients can be out of bed and will be encouraged to be out of bed for as long as reasonably tolerated.
3. Activity level/ limitations per doctors' guidelines are implemented.
4. Dressings will be changed daily.
5. If a drain has been placed, it may be removed within the first three days of surgery.
6. Leg stretching exercises should be avoided after all lumbar procedures.
7. Keep the wound dry after surgery until the staples or sutures are removed, usually in 10-12 days - CALL YOUR DOCTOR'S OFFICE AS SOON AS YOU LEAVE THE HOSPITAL TO SET UP AN APPOINTMENT.
8. Take only the pain killers provided by your physician and avoid over-the-counter medications, including Tylenol, Aleve, Advil, Ibuprofen, Motrin or Aspirin AS SOME OF THEM MAY CAUSE BLEEDING.

ANTERIOR CERVICAL DISCECTOMY WITH FUSION

By M. Viktor Silver, MD, FRCSC, FACS, FAANS

Anterior cervical discectomy with fusion is an operative procedure to relieve compression or pressure on nerve roots and/or the spinal cord due to a herniated disc or bone spur in the neck.

In anterior cervical discectomy with fusion, the surgeon approaches the cervical spine through a small incision in the front of the neck and removes the total disc or a part of the disc along with any bony material that is compressing or putting pressure on the nerves and producing pain. Spinal fusion implies placing a bone graft between the two affected vertebral bodies encouraging the bone growth between the vertebrae. The bone graft acts as a medium for binding the two vertebral bones and grows as a single vertebra that stabilizes the spine. It also helps to maintain the normal disc height.

INDICATIONS

Herniated disc is a condition in which the soft, gel-like center of the disc (nucleus pulposus) bulges out through the damaged or broken disc's tough, outer ring (annulus fibrosus). Besides, bony outgrowths also known as bone spurs or bone osteophytes are formed due to the accumulation of calcium in the spine joints. The pressure induced by a herniated disc or bone spur on nerve roots, ligaments or the spinal cord may cause pain in the neck and/or arms, numbness or weakness in the arms, forearms or fingers, and lack of coordination. As most nerves to the body (e.g., arms, chest, abdomen, and legs) pass through the neck region from the brain, pressure on the spinal cord in the neck region (cervical spine) can be very problematic. Patients with these symptoms are potential candidates for anterior cervical discectomy procedure but only after non-surgical treatment methods fail. Cervical discectomy can reduce the pressure on the nerve roots and provides pain relief.

Before recommending surgery, your surgeon considers several factors such as your health condition, age, lifestyle and anticipated level of activity following surgery. A thorough discussion with your surgeon regarding this treatment option is advised before scheduling the surgery.

PROCEDURE

Your surgeon makes a small incision in the front side of the neck and locates the source of neural compression (pressure zone). Then, the intervertebral disc that is compressing the nerve root will be removed. Afterwards, a bone graft will be placed between the two vertebral bodies. In certain instances, metal plates or pins may be used for providing enough support and stability, and to ease the fusion of the vertebrae.

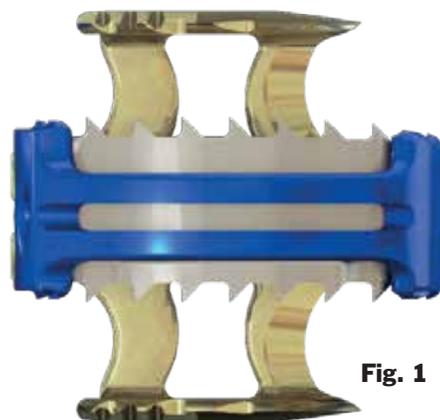


Fig. 1

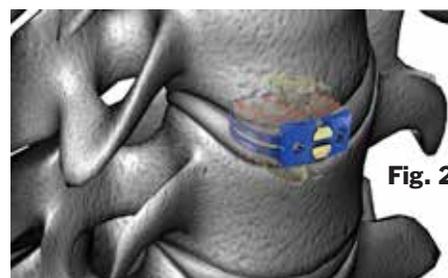


Fig. 2

FIG. 1-2:

Aero-C is a minimally invasive technique for cervical spine fusion with new Aerofoil™ Compression Technology:

- Shaped like inverted plane wings, Aero-C's unique anchors are designed to pull the vertebral bodies towards the implant as it is inserted, creating compressive forces

at the implant-to-endplate interface

- In accordance with Wolff's law, compression creates a healing environment known to stimulate bone growth.

- Integrated one-step locking mechanism is designed to lock anchors to the implant

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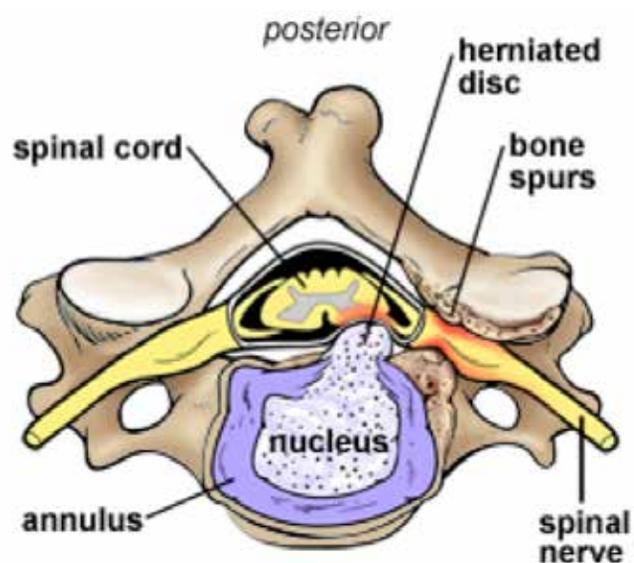
RECOVERY

A specific post-operative recovery/exercise plan will be given by your physician to help you return to normal activity at the earliest possible. The duration of hospital stay depends on this treatment plan. You will be able to wake up and walk by the end of the first day after the surgery. You would be able to resume your work within 3-6 weeks, depending on your body's healing status and the type of work/activity that you plan to resume. Discuss with your spinal surgeon and follow the instructions for optimized healing and appropriate recovery after the procedure.

RISKS OR COMPLICATIONS

Treatment results are different for each patient. In addition to the anesthetic complications, spinal surgery is associated with some potential risks such as infection, blood loss, blood clots, nerve damage, paralysis and bowel and bladder problems. Failure to fuse the vertebral bones with the bone graft (fusion failure) is an important complication of spinal fusion which requires an additional surgery and might be minimized with smoking cessation.

Please take your physician's advice for a complete list of indications, clinical results, adverse effects, warnings and precautions, and other relevant medical information about the anterior cervical discectomy with fusion surgery. 



MINIMALLY INVASIVE CORTICAL TRANSFORAMINAL LUMBAR INTERBODY FUSION (CLIF) USING CORTICAL BONE TRAJECTORY SCREW FIXATION

By M. Viktor Silver, MD, FRCSC, FACS, FAANS

A transforaminal cortical lumbar interbody fusion (CLIF) is a surgical procedure that stabilizes the spine and reduces back and leg pain by joining two or more vertebral bones by fusing them with bone forming across the disc space. This minimally invasive technique is used to prevent abnormal movement and allowing for restoration of disc height which then relieves the pressure on the spinal nerves and alleviates leg and back pain without having to open the patient from the front or abdomen and back or a “360” fusion as some of those surgeries are known.

With this minimally invasive procedure, the entire surgery is done from the back. The final advantage is that by using this new minimally invasive screw placement technique, **cortical screw fixation**, the surgery can be done with only one small incision not too different in size from a simple surgery for removal of a herniated or degenerated disc.

Who is a candidate for a CLIF with Cortical Screws?

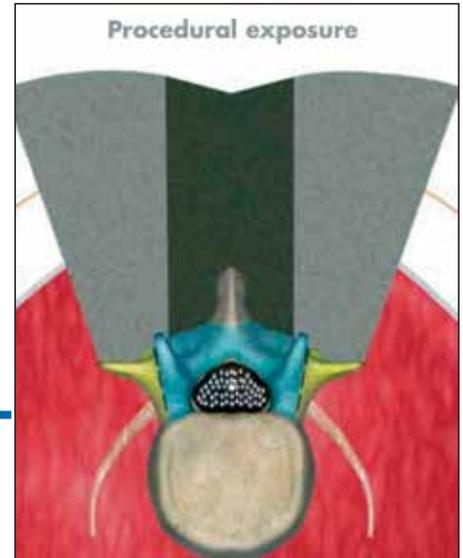
Patients with back pain and leg pain, weakness, or numbness who have failed conservative measures (physical therapy, medication, injections, etc.) and who have evidence of disc degeneration or instability on MRI and for a number of other reasons, including bulging, missing, or compromised discs, narrowing of the spinal canal or spinal stenosis, degenerative disc disease, and spondylolisthesis.

What is a minimally invasive surgical approach?

Minimally invasive spine surgery is performed through a small incision in the back and uses intraoperative X-ray, tubular retractors, and special instruments to avoid extensive damage to the back muscles and sometimes

Outer gray area: Traditional technique with extensive muscle dissection and longer incisions.

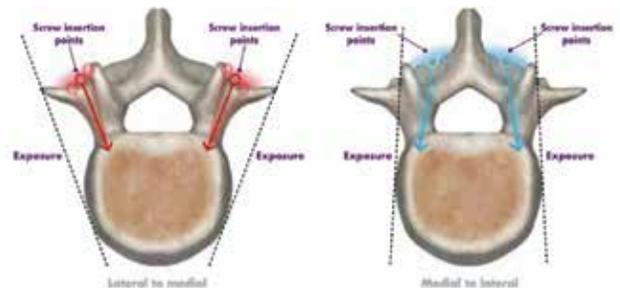
Center darker gray area: New minimally invasive technique with cortical screws with a single very small incision and minimal muscle dissection still allowing for thorough decompression of the spinal nerves.



computer or robot guidance.

Right, center: Placement of cortical screws via a small midline incision with the screws coming in from the center of the incision allowing for minimal disruption of tissues and less pain post-operatively.

Minimally invasive surgery has many advantages over traditional (or open) spine surgery that include smaller incisions, less blood loss, smaller scars, a shorter hospital stay, less pain during recovery, and a faster return to work and daily activities.



Small midline incision similar in size to one of a simple removal of a herniated disc through which a circumferential or “360-degrees” fusion can be performed without ever needing to open the patient from the abdomen.



What is the recovery like?

The patients typically spend 2-3 days in the hospital. The main restrictions are no heavy lifting (no more than 10 lbs. for the first 3 months) and no repetitive bending or twisting at the waist.

Most patients return to light duty or office-type work in 4-6 weeks. Physical therapy is started between 6 and 12 weeks, if necessary.

What follow-up care is necessary?

The patient is seen one week after surgery, and then at 6 weeks, 4 months. X-rays or CT-scans are performed along the way to assess progression of fusion.

What are the benefits of a CLIF?

The main purpose of a CLIF is to improve back and/or leg pain. Patients who are good candidates for a TLIF often experience dramatic improvement in back and leg pain after recovering from surgery.



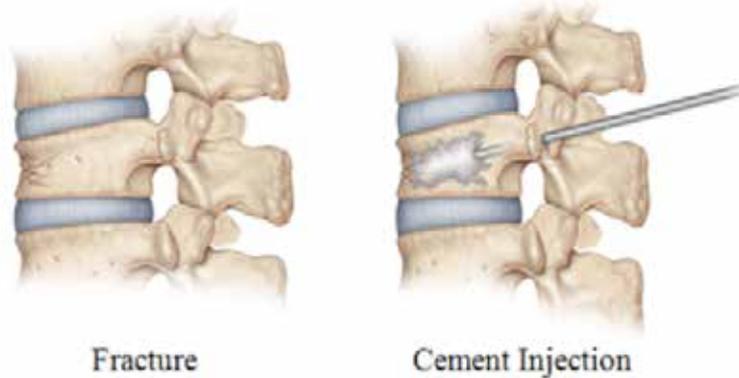
VERTEBROPLASTY AND KYPHOPLASTY

By M. Viktor Silver, MD, FRCSC, FACS, FAANS

Vertebroplasty and Kyphoplasty are similar medical spinal procedures in which bone cement is injected through a small hole in the skin (percutaneously) into a fractured vertebra. The needle makes a small puncture in the patient's skin that is easily covered with a small bandage after the procedure.

Vertebroplasty is an outpatient procedure for stabilizing compression fractures in the spine. The cement hardens, stabilizing the fractures and supporting your spine. Patients go home the same day with a Band-Aid to be changed daily and follow-up in 7-10 days with no activity restrictions.

For people with severe, disabling pain caused by a compression fracture, vertebroplasty can relieve pain, increase mobility and reduce the use of pain medication.



LATERAL LUMBAR FUSION

By M. Victor Silver, MD, FRCSC, FACS, FAANS

The Lateral Interbody Fusion is an approach to spinal fusion in which the surgeon accesses the intervertebral disc space and fuses the lumbar spine (low back) using a surgical approach from the side (lateral) rather than from the front (anterior) or the back (posterior). Spinal fusion is a surgical procedure in which two or more of the vertebrae in the spine are united together so that motion no longer occurs between them eliminating back pain and abnormal movements of the spine.

The Lateral Lumbar Fusion is a type of interbody fusion, where the disc in the front of the spine is removed and replaced with an implant containing a bone graft to set up the condition for the two vertebrae to fuse together through the disc space.

It is a minimally invasive type of spine surgery designed to accomplish a spinal fusion with sev-



Traditional Posterior Lumbar Interbody Fusion exposure involved bilateral resection of back muscles, bone, and posterior ligaments.



The Lateral Lumbar Fusion procedure avoids cutting of muscle or bone, resulting in shorter hospital stays and faster recovery.

- eral advantages including:
- Minimal tissue damage with no need to work on back muscles with less pain after surgery and faster recovery.
 - Minimal blood loss.
 - Small incisions and scars.
 - Minimal post-operative discomfort.
 - Significant improvement of chronic back pain.
 - Relatively quick recovery time and return to normal function. Patients usually walk the day of surgery.

In some cases, it requires only 1 or 2 days of hospital-stay, compared to several days of immobility and hospitalization after traditional procedures.

Please, come and experience a concise, positive and straightforward approach to your spinal problem.

Stop taking pain pills and crying, come see Dr. Silver, for a caring approach to your spinal pain and for a completely new outlook on life.



Case Example/Patient Testimonial:

Richard Hatch, 54-years-old, RN, with years of chronic back and leg pain, progressively getting worse. When he came to the office, the only way that he could get any relief was on fetal position and that's how he laid on the examining table.

He had tried everything in his life, including chiropractors, physical therapy, and pain doctors and could no longer work.

After a multilevel minimally invasive lateral lumbar fusion, he is pain-free for the first time after 25 years. He is finally able to walk and stand without pain and taking no pain medications! And working full-time!

POST-OPERATIVE REHAB PROGRAM

LUMBAR FUSION

PRECAUTIONS

1. Strictly NO bending, NO lifting anything heavier than 10 lbs. and NO twisting.
2. Lumbar braces are to be for ambulation or transfer and to be removed when in bed or chair, unless instructed differently by your doctor. Lumbar braces are generally worn for about 4 months. At that time, additional X-rays or a CT scan will determine if you need them longer.
3. Activity level/limitations: Depending on the surgery, you may not have limitations on how long patients can be out of bed and will be encouraged to be out of bed for as long as reasonably tolerated.
4. ABSOLUTELY no tight clothing over incision. Specifically, avoid jeans, belts, sweat pants, elastic bands or underwear. Males are encouraged to wear an overhauled and women a gown with no underwear to avoid pressure on the incision for 3 weeks.

REHAB GOALS AND PROGRAM

1. Instructing patients on movement precautions and activity limitations as appropriate.
2. Instructing patients in functional activities which consists of:
 - a. bed mobility following log rolling technique for getting out of bed
 - b. safe transfer skills
 - c. gait training with appropriate assistive device (when appropriate, rolling walkers are preferred to limit lifting by the patient)
 - d. ambulation is encouraged and progressed within patient tolerance
3. Instructing patients on proper posture and recommended positioning in the chair or in the bed and home care for the spine.

In-hospital care

Initial evaluation is performed unless otherwise ordered by the physician.

All attempts are to be made to coordinate with nursing staff so patients are medicated for pain (if/when needed) prior to therapy interventions.

Rehab goals and program will be initiated.

Activity level/ limitations per doctors' guidelines are implemented.

Dressings will be changed daily or every other day.

If a drain has been placed, it may be removed within the first few days of surgery.

Leg stretching exercises should be avoided after all lumbar procedures, with or without fusion to avoid stretching of the SCIATIC NERVE AND RELAPSE OF PAIN. CROSS YOUR LEGS TO PUT YOUR SHOES ON.

After Hospital Discharge

1. Patients are progressed on their Rehab program as per plan of care established.
2. When patients have progressed to a level of needing minimum assistance, their treatment frequency is reduced.
3. Assistive devices may be recommended at the bedside if/when appropriate to encourage increase ambulation activities.
4. Patients will be discharged from therapy program with appropriate written instructions.
5. A brace will be required for 4 months after lumbar fusion. KEEP THE SURGICAL DRESSING CENTERED AT THE BACK OPENING OF THE BRACE. AVOID THE BRACING RIDDING OVER THE INCISION LINE BY CHECKING AND REPOSITIONING THE BRACE AFTER YOU STAND UP.
6. Keep the wound dry after surgery until the staples or sutures are removed, usually in 10-14 days – CALL YOUR DOCTOR'S OFFICE AS SOON AS YOU LEAVE THE HOSPITAL TO SET UP AN APPOINTMENT.
7. The Back brace is your best friend as it protects the surgery just done by preventing you from bending or twisting your Back – USE YOUR BRACE AS INSTRUCTED BY YOUR DOCTOR.
8. Take only the pain killers provided by your physician and avoid over-the-counter medications, including Tylenol, Aleve, Advil, Ibuprofen, Motrin or Aspirin – ANTI-INFLAMMATORIES CAN BLOCK THE BONE HEALING OR FUSION WHICH CAN PUT YOUR SURGERY AT MAJOR RISK.
9. NO SMOKING – like the anti-inflammatories, smoking can block the fusion CAUSING MORE PAIN AND THE SCREWS COMING LOOSE– COMPLY WITH THE DOCTOR'S INSTRUCTIONS AND YOU WON'T NEED TO DO MORE SURGERY TO FIX YOUR PROBLEMS!
10. For pain refills after surgery, remember to call your doctor's office during regular hours and allow at least 24 hours to have your prescription refilled – PLAN IN ADVANCE, especially on Fridays.
11. Showering and sexual activity instructions will be provided by your doctor depending on the type of surgery performed.

SPINAL CORD STIMULATION

By M. Victor Silver, MD, FRCSC, FACS, FAANS

Spinal cord stimulation (SCS) is a pain-relief technique that delivers a low-voltage electrical current continuously to the spinal cord to modifying or block the sensation of pain. SCS is the most commonly used implantable neurostimulation technology for management of pain syndromes. As many as 50,000 neurostimulators are implanted worldwide every year. SCS is a widely accepted, FDA-approved medical treatment for chronic pain of the trunk and limbs (back, legs and arms).

Spinal cord stimulation, also called neurostimulation, directs mild electrical pulses to interfere with pain messages reaching the brain. A small device implanted near the spine generates these pulses. The implanted generator used in spinal cord stimulation has similarities to a cardiac pacemaker, leading some to call the device a pacemaker for pain.

Spinal cord stimulation has been used for decades and is being recommended for an increasing number of conditions. Failed back surgery syndrome, cervical and lumbar radiculitis, neuropathy, and complex regional pain syndrome are some conditions that may be helped by the therapy.

SPINE CORD STIMULATION TRIAL

A person considered a good candidate for spinal cord stimulation therapy is usually scheduled for a trial run, which involves insertion of thin wires with electrodes attached. The trial period is similar to long-term therapy, except that the device transmitting current is not implanted in the body. Instead, just the wires are inserted and an external transmitter taped over the patient's skin

sends electrical pulses to the electrical contacts near the spinal cord for a few days. And then removed.

- It can help the patient/physician analyze whether SCS effectively relieves pain
- It provides the patient/physician with an assessment period to determine which type of SCS technology works best
- It enables the patient/physician to evaluate different stimulation settings and programs

Permanent Implantation

The permanent implantation may be performed while the patient is under sedation or general anesthesia. First, one or more permanent leads are inserted through an epidural needle or a small incision into the predetermined location in the epidural space. The surgeon removes a portion of the lamina. This will make space for insertion of the permanent paddle lead. The paddle lead is passed through the opening in the lamina and into the epidural space. The surgeon confirms correct placement of the lead through the use of an x-ray device called a fluoroscope.

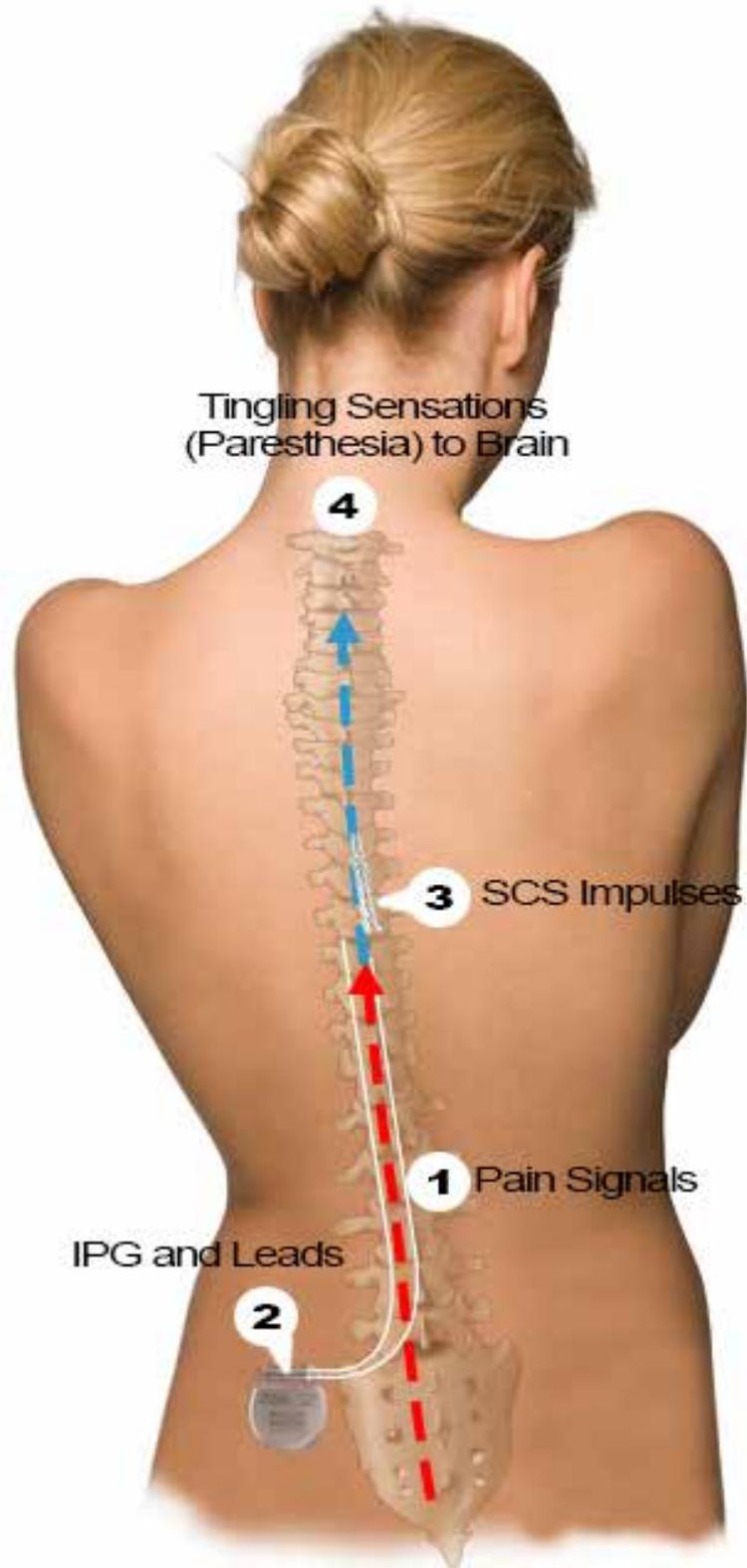
Next, a small incision is created and the implantable pulse generator (IPG) battery is positioned beneath the skin. It is most often implanted in the buttocks or belt-line area.

At the end of the procedure, the implant's electrical pulses are programmed with an external wireless programmer. The patient can use the programmer to turn the system on or off, adjust the stimulation power level and switch between different programs. This is usually done as day-surgery and the patient is discharged home sometimes with home health care and follow-up within 7-10 days.

HOW SPINAL CORD STIMULATION THERAPY WORKS

In use for more than 40 years, spinal cord stimulation (SCS) delivers pulses of electricity directly to the nerves.

1. Pain signals travel along the spinal cord to the brain.
2. A small, rechargeable Implantable Pulse Generator (IPG) produces electrical impulses. These impulses travel along small wires called leads.
3. Electrode contacts are engineered to deliver the electrical impulses to specific locations on the spinal cord to mask the pain signals.
4. The masked signals then travel to the brain where they are perceived or felt as a smooth, tingling sensation called paresthesia, and the feeling of pain may be reduced.



Experience You Can Trust

M. Viktor Silver, MD, FACS, FRCS, FAANS
Double-Board Certified Spine-Fellowship Trained Neurosurgeon



An Academic Neurosurgeon with 14 years of experience in complex cases, Dr. Silver Specializes in:

- Non-Surgical Approaches to Spinal Pain. Dr. Silver works cohesively with pain specialists, chiropractors and physical therapy clinics to allow for **recover without surgery**.
- Minimally Invasive Spine Surgery, **often same-day surgery**.
- Lumbar Fusion Surgery using Newer Technologies and Approaches for Faster Recovery, **most fusion surgeries can leave the hospital in 1-2 days**.
- Compression Fractures and Kyphoplasty
- Spinal Stenosis
- Disc Herniation and Sciatica Pain
- Cervical Disc Replacement
- Computer-Guided Spine Surgery

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