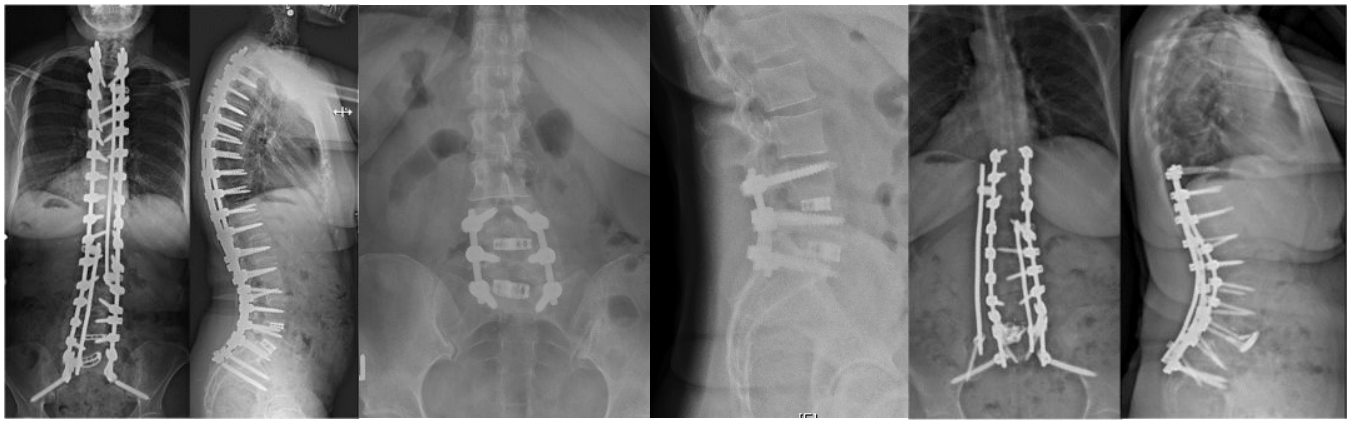
Daniel and Jane Och Spine Hospital

ColumbiaDoctors NewYork-Presbyterian The Allen Hospital

Spinal Fusion Surgery: What to Expect



Date of Surgery:

_____

Type of Surgery:

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_____

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Daniel and Jane Och Spine Hospital

ColumbiaDoctors NewYork-Presbyterian The Allen Hospital

Important Phone Numbers

Och Spine Hospital (Dr. Lombardi's office, scheduling, billing, radiology, parking, directions…)	212-932-5100
After Hours Emergencies	212-932-5100
- Surgical Scheduler	212-932-5105 212-305-7314--Fax
Radiology Scheduling (MRI, CT, Ultrasound)	212-305-9335
Columbia Doctors Midtown Radiology Scheduling	212-326-5551
Interventional Radiology @ Milstein Hospital - Central Lines - CT/Myelograms	212-305-5123
Allen Hospital Client Services	(212) 932-5772

Helpful Websites

The Daniel and Jane Och Spine Hospital: www.nyp.org/spinehospital

Columbia Doctor's Orthopedics: www.ColumbiaOrtho.org

Scoliosis Research Society: www.srs.org

Cervical Spine Research Society: www.csrs.org

Spine Health: www.spine-health.com

Parking

Allen Hospital: Parking is Valet Parking Only. You may also park on the street if parking is available. There is a parking garage approximately 1 block away that has pay by the hour parking.

CHONY: There is Valet Parking available in the front of the building. There is also a parking garage approximately 1 block away that has pay by the hour parking.

Visiting Hours

Allen Hospital: The Allen Hospital has open visiting hours. Children under 12 need to be accompanied by an adult at all times when visiting. Please be respectful when having family visit in the evening hours and overnight.

CHONY: CHONY has open visiting hours for family. For all visitors that are non-family, visiting hours are until 10pm.

Introduction

Thank you for trusting Dr. Lombardi and the Och Spine Hospital for your spine surgery. We have created this spinal fusion booklet to help guide you through your spinal fusion surgery. This spinal fusion booklet is designed to give you more detailed information about what to expect before during and after your spinal fusion. Please review all of the information. Feel free to call or email Dr. Lombardi's team with any questions. We want to empower you to be part of your medical care.

Patient Expectations:

1. You are a crucial member of the health care team.
2. Be honest and forthcoming about your medical history and medications that you take. This will help us make your surgery safer.
3. You are responsible for obtaining your ordered testing and making sure that the results are sent back to the office for review.
4. Ask questions. As a patient you are allowed to ask questions and communicate with Dr. Lombardi's team. We want you to be knowledgeable about your spine care.
5. Check on your insurance. We submit the surgery to your insurance for pre-authorization approval. However, it is ultimately your responsibility as a patient and a consumer to make sure that you have selected a provider that is in-network with your insurance
6. Communicate schedule changes or cancelations needed on your end to Dr. Lombardi's team in a timely manner.

Surgery Insurance Preauthorization

Columbia University will submit your surgery and hospital stay for preauthorization to your insurance company. For questions regarding insurance please call, surgical scheduler at 212-932-5105. It is always a good idea to be your own advocate. Please check with your insurance company to make sure that Dr. Lombardi is an on par provider.

Patients Traveling for Surgery

We encourage you to plan on staying in the greater New York area for about a week after surgery. This makes it much easier for us to help you if problems occur in the early postoperative period and you do not live within easy driving distance.

When booking your hotel accommodations, make sure you request a handicapped room.

If you are driving, it is recommended that you plan on driving no longer than 5 hours a day. It is also recommended that you stop every 1 to 1½ hours and get out of the car and walk in order to get your heart pumping and your blood circulating.

If you are flying home, you should contact the airport to have someone meet you with a wheelchair so they can assist you. When making your reservations, it is advisable to ask for an aisle seat or the front row for easier accessibility.

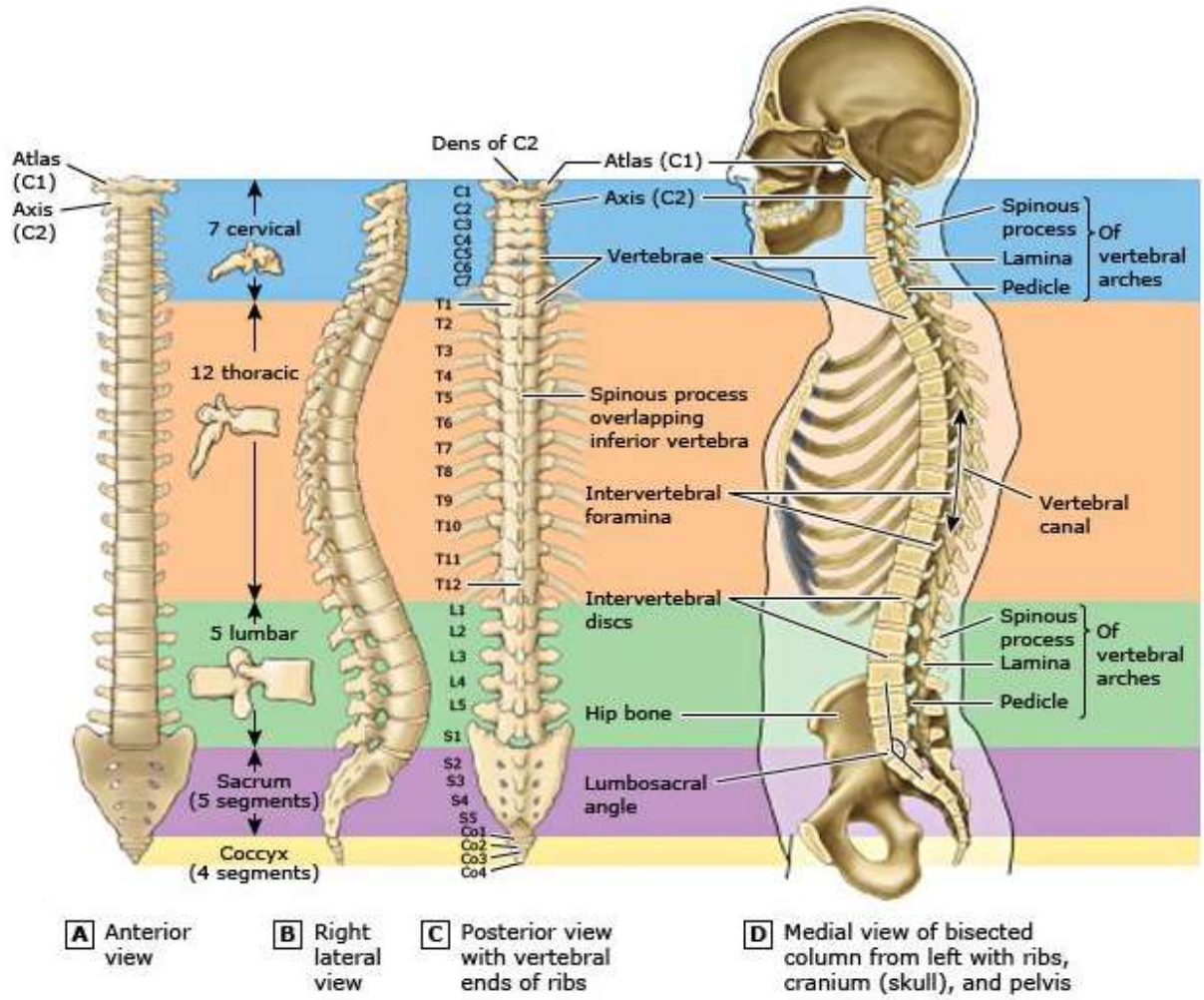
We recommend that you book a flexible flight and investigate any change fees. It is hard to predict when you will feel ready to fly home, and Dr. Lombardi's schedule is subject to change

Surgery Schedule Changes

Unfortunately, Dr. Lombardi's schedule is variable due to the highly complex nature of his practice. We will do our best to minimize any rescheduling but occasionally it is impossible to avoid. We apologize in advance if this occurs in your case. Your surgery date and/or your pre-op visit date may change; please plan accordingly. In addition to his own patients that may have urgent issues, he is often asked to take care of many other surgeons' most complex cases, some with severe medical or spinal cord/nerve root-related issues that require priority scheduling.

General Spine Information

Spine anatomy overview



You are going to have spinal fusion surgery. This is a decision reached by you and Dr. Lombardi after careful consideration.

Your spine is made of 26 bones known as vertebrae (7 cervical, 12 thoracic, 5 lumbar, the sacrum and coccyx). Each vertebra is separated by a disc (except the top two neck vertebrae). Each disc has a soft, jelly-like center

surrounded by a tough outer layer of fibers known as the annulus. Discs, bony structures, ligaments and strong muscles stabilize the spine. The spinal cord passes through the bony spine.

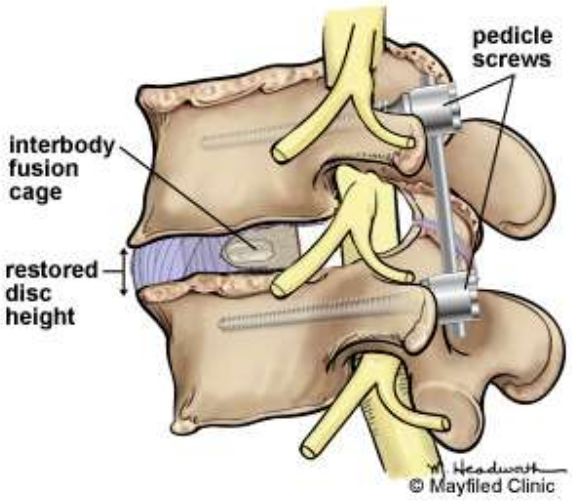
The spinal cord is composed of nerves leading to and from the brain. It controls and transmits all muscle movement and sensation for the trunk, arms and legs. Nerve roots come from the spinal cord and carry electrical impulses to and from muscles, organs and other structures. These nerve roots can become pinched or irritated by abnormal conditions.

Spinal curvatures called scoliosis and kyphosis can be due to degenerative changes, instability, or an idiopathic (unknown) cause. These conditions can also be corrected by a spinal fusion. Some degenerative conditions such as degenerative lumbar scoliosis, spondylolisthesis, and degenerative disease with spinal stenosis may also be treated with a spinal fusion. A spinal fusion entails the uniting or "welding" of the spinal vertebrae after correction of the spinal deformity with spinal instrumentation.

Spinal Fusion

Dr. Lombardi will choose the best instrumentation and fusion procedure for your individual needs. Since Dr. Lombardi is expertly trained in both degenerative and deformity spine surgery, he is able to tailor your surgery to you as an individual based on your symptoms and outcome goals.

A **Spinal Fusion** is a surgical procedure to permanently join bone by interconnecting two or more vertebrae in order to prevent motion, to relieve pain and prevent further degeneration. Dr. Lombardi will make an incision(s) on your back for a posterior spinal fusion. You may have an anterior spinal fusion through a lateral (side) or lower abdominal approach. He will then put in rods, screws, and cages to stabilize the affected area while the bone graft is healing or fusing. Your own bone obtained from your spine will be used for the fusion, while cadaver (Allograft) bone and BMP- a genetically engineered protein may also be needed to obtain a fusion.



Your surgery may include one of the following additional techniques if indicated by Dr. Lombardi.

Oblique Lateral Interbody Fusion (OLIF): Allows the spine surgeon complete minimally invasive solution for the treatment of degenerative lumbar conditions. This allows placement of a large interbody graft into the

disc space. Patient is positioned on the left side. Incision is made on the abdomen to the left side the blood vessels, muscles and tissues are moved to the side. This will allow access to the spine from the front of the body. Spine surgery from the front will allow for additional stability to the fusion. A cage and bone graft is inserted into the disc space to maintain disc height and increase the chances of fusion. The anterior or "from the front" approach will be done first. Once completed, the patient is turned and the posterior portion of the surgery is done if indicated by Dr. Lombardi.

Transforaminal Lumbar Interbody Fusion (TLIF): is a procedure that fuses the anterior and posterior columns of the spine through a posterior approach. A bone graft and interbody spacer (cage) stabilize the anterior portion while the posterior is locked in place with pedicle screws, rods and bone graft.

Decompression: This procedure is carried out to relieve pressure on the spinal cord or nerve roots. The pressure may result from fracture fragments, disc fragments, bone spurs, tumors or infections.

Discectomy: The excision of the intervertebral disc material that may be described as herniated, implying "bulging" or "ruptured" through the ligaments. If the central fragment of disc material has torn through a hole in the ligament, it is called an extruded fragment or extruded disc. The term herniated nucleus pulposus (HNP) is a catchall phrase for all of these conditions.

Laminectomy: An operation for removal of part or all of the lamina of a vertebra commonly performed in order to be able to remove an intervertebral disc protrusion or to decompress a nerve root.

Foraminotomy: A procedure carried out in conjunction with disc surgery. The foramen (openings for the individual nerve roots to pass from the spine) may become narrowed because of disc impingement, intervertebral collapse, and spondylolisthesis. The surgical widening of the foramen is an attempt to relieve the pressure on the nerve roots.

Osteotomy: The surgical removal of a wedge or piece of vertebral bone to alter the alignment of the spine. Examples would be a Posterior Column Osteotomy (PCO) and a pedicle subtraction osteotomy (PSO).

Pedicle Subtraction Osteotomy (PSO): Reshaping the entire vertebra to provide marked deformity correction for stiff and large curves. The prototype of a PSO is to treat lumbar flatback syndrome.

Vertebrectomy or Vertebral Column Resection (VCR): Removal of the whole vertebra to facilitate more correction of the spine, done usually through an all posterior approach.

Risks of Surgery

There are risks associated with any surgery. We tell you about these risks to make sure you have all the information you need to make an informed decision. Keep in mind that for all risks, steps are taken to minimize and/or prevent them from occurring.

We can't list, nor can we predict every possible thing that may happen. Following are some of the more common minor complications that may occur.

- Risks Associated with General Anesthesia: throat discomfort, injury to teeth or dental work, injury to eyes, blindness, vocal cord injury, headache, backache, nerve damage, awareness under anesthesia, allergic reactions, stroke and heart attack.
- Muscle soreness/painful pressure areas from positioning in surgery
- Skin numbness on the back near the incision
- Superficial wound infection or deep wound infection
- Bladder infection
- Excessive Pain
- Constipation
- Ileus: Slowing of the abdominal tract with bloating and constipation caused by the surgery, anesthetics, pain medicine and postoperative inactivity.
- Transient nerve irritation (pain/numbness/weakness) – from manipulating/moving nerves during surgery.
- Blood Clot: pulmonary embolism (PE) or deep vein thrombosis (DVT)
- Spinal fluid leak or Dural tear
- Postoperative pulmonary problems
- Postoperative depression
- Neurologic deficit, up to and including paralysis
- Pseudarthrosis or failure to fuse
- Failure of instrumentation

Preparing for your Surgery

Pre-Operative Testing

Dr. Lombardi will order some pre-operative testing for you to complete before your surgery. The clinical staff will provide you with orders for any testing that need to be done with Columbia University/New York Presbyterian at the time of your appointment. You will be instructed to take these orders to the front desk to schedule them when you check out.
During your visit you'll be given a packet of information which will outline what test need to be done before surgery and critical information/forms for your primary care doctor

1. Take the packet and orders to your primary care provider for the required clearance for your surgery.
2. Have your primary care provider send us a note of clearance and the results for the attached testing
3. If you do not have a primary care provider, please take your packet to Pre-Admission Testing at the Heart Center 173 Fort Washington Ave, New York, NY 10032. Please let Clinical staff know when this is complete so she can review all results.

Pre-Operative appointment with Dr. Lombardi

Dr. Lombardi may require you to see him within 30 days of your surgery date for a preoperative appointment. If a pre-op appointment hasn't been made for you already, please call 212-932-5100 (option #1) to schedule this appointment. You may want to consider coordinating your pre-operative appointment with Dr. Lombardi and any additional testing that needs to be completed at one of our facilities.

Type and Screen

For patients having larger surgeries, you will be required to have a type and screen (your blood type) drawn at the Spine Hospital prior to your surgery. This allows the hospital to cross match your blood prior to your procedure so they can make sure that there is blood available for your surgery if needed. The lab is walk in. You can complete this test before or after your pre-operative appointment with Dr. Lombardi. If you are unsure if you need to complete this test or not, please ask Clinical staff.

Getting your Home Ready

Before you have spinal fusion surgery you should prepare your home for your post-operative condition. After a spinal fusion you will need to follow spinal fusion precautions called BLT's. No Bending, no lifting, no twisting and no stooping/squatting. To comply with these precautions, you may need to make some changes to your home.

- Move frequently used items to more easily accessible locations. Items that you use every day should be somewhere that you can reach without assistance.
- Clear a safe pathway in your home. Move area rugs or other tripping hazards so you are able to walk around your home for exercise. You will also want a clear pathway to the bathroom and kitchen.
- Showering: please install a handheld shower head in the shower you will use. This will help you keep your incision dry while showering. You may also want to buy or rent
- Sleeping: you may sleep in your own bed as long as it is not low to the ground or a water bed.
- Adaptive Equipment: Some homes have low toilets that are hard to get up from. If you have a home with a lower toilet you may want to buy or rent a bedside commode to use over the toilet. This is more stable since it has 4 legs and arms. If you do not have room in your bathroom for a bedside commode, a toilet seat riser would work.



Home Assistance

- Help at home: Make arrangements before you have surgery to have help at home once you're discharged. Friends and family can take turns. You will likely need someone with you at all times for the first 1-2 weeks after surgery. Once you are feeling steadier you won't need as much help. This will vary by patient.
- Chores: you will be limited by your precautions so make sure you have someone to help you manage your home.
- Services: Grocery delivery, home cleaning, dog walking/pet care, laundry service and car service (like Uber) can make your life after surgery easier.
- Dog Walking: in order to comply with your spinal fusion precautions after surgery, you will not be allowed to walk your dog on a leash. Please make arrangements for someone to care for your pet or hire a dog walker.

Medications to Stop

Prior to your surgery we ask that you stop certain medications to help optimize your surgical outcome. Some medications can lead to increased risk of bleeding or increased risk of blood clots. Below is the preferred schedule for stopping medications. However, your prescriber may change this schedule.

1 month before surgery:

- Hormones and birth control will need to be stopped 1 month before surgery, and can be re-started 2 weeks after surgery

10 days prior to surgery:

- Stop all anti-inflammatory medications: Including NSAID's and steroids, for example: Advil, Aleve, Prednisone, Diclofenac, Meloxicam, Aspirin etc… These medications can be restarted 4 months after surgery.
- Supplements: for example, multi-vitamins, calcium, fish oil, etc… These can be restarted after your surgery
- Blood Thinners: for example, Coumadin, Heparin, Lovenox, Eliquis, Xarelto, etc… these will be restarted after your surgery under the direction of your prescriber.
- Bone Health medications like Forteo, Reclast, Fosamax, etc… Forteo can be restarted 1-week Post op. Fosamax and Reclast can be restarted at 4 months post op.

What to Bring to the Hospital

- Photo ID and insurance card
- Toiletries. Basic toiletries toothbrush, toothpaste, comb, brush, deodorant, soap, shampoo, conditioner and lotion are available at the hospital. If you'd prefer to use your own toiletries bring them
- A list of your home medications. If you take any medications for migraines or have a specific formulary medication, please bring that in the original bottle for the pharmacist to review.
- Loose-fitting clothing with elastic waistbands are recommended after discharge as they are easier to put on and take off and you may have some postoperative swelling. You may bring rubber-soled slippers and a robe for out-of-bed activities.

The night prior to your surgery **DO NOT DRINK OR EAT ANYTHING AFTER MIDNIGHT** the night before your surgery.

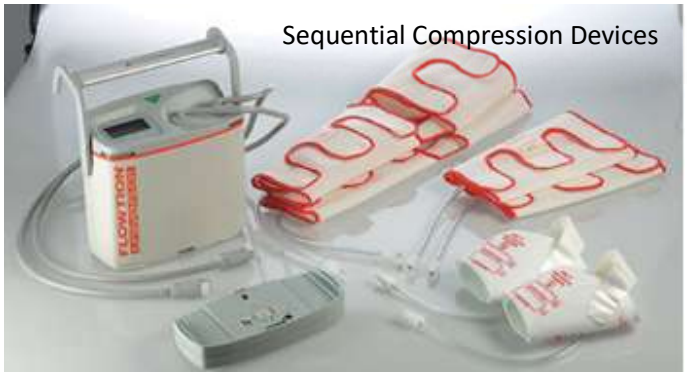
It is suggested to eat light meals the day before surgery and make sure your bowels have been regular prior to surgery.

Hospital Stay

Immediately after your surgery you will be taken the PACU (post anesthesia care unit aka recovery room). You will spend a few hours in this area while you are closely monitored after your surgery.
Adult patients will be transferred to the spine floor, 2 River West. For longer surgeries, patients will go the ICU on 2 River East for 1 to 2 days.

Pediatric patients at CHONY will go to the Pediatric Intensive Care Unit (PICU) for 1 to 2 days after surgery. Patients will then be transferred to the regular nursing floor for the remainder of their hospitalization. Some

patients will go directly to the nursing floor from the recovery room.



Sequential Compression Devices

During the first 1-3 days of your recovery you will be monitored closely.

- You may have a cardiac monitor on to watch your heart rate and rhythm.
- You will have oxygen to make breathing easier.
- You will wear inflatable plastic wraps (sequential pumps) and may also wear elastic, thigh-high stockings (TED hose) on your legs. Both the TED hose and sequential pumps are used to help prevent blood clots.
- You may have a Foley catheter. This is a tube that is placed into the bladder to drain urine. The catheter will be inserted after you are asleep in surgery. Your nurse will monitor the amount and color of your urine to make sure you are getting enough fluids. The Foley catheter will be removed once you are able to get out of bed fairly easily.
- You will have one or more drains (Hemovac) near your back, front, and/or side incision(s). These drains collect excess bleeding and drainage from under the skin. This keeps your wound from swelling and helps the doctors estimate your blood loss.
- Some patients will receive a blood transfusion either during surgery or after surgery. Most patients do not require this but those patients scheduled for larger surgeries should anticipate receiving a transfusion at some point during their hospital stay.



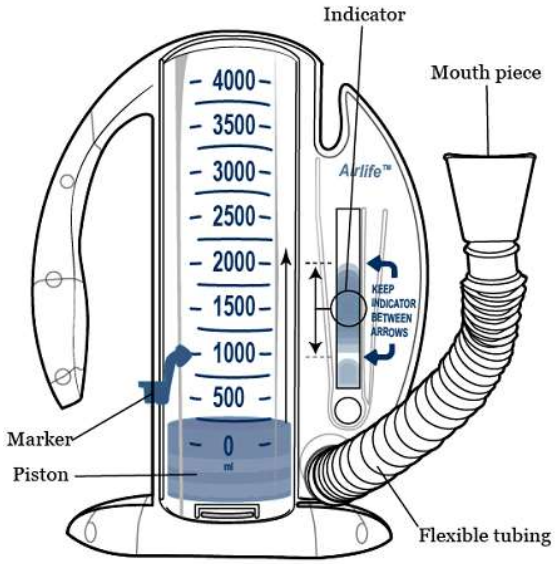
Hemovac drain

Nurses will be listening to your lungs and helping you take deep breaths and cough. An Incentive Spirometer (IS) is also used to help you measure how deeply you breathe. Family members, please remind your loved one to use the IS frequently in the hospital.

When you are using your incentive spirometer, make sure to breathe through your mouth. If you breathe through your nose the incentive spirometer will not work properly. You can plug your nose if you have trouble.

If you feel dizzy at any time, stop and rest. Try again at a later time.

To use your incentive spirometer, follow the steps below.



1. Sit upright in a chair or in bed. Hold the incentive spirometer at eye level.
2. Put the mouthpiece in your mouth and close your lips tightly around it. Slowly breathe out (exhale) completely.
3. Breathe in (inhale) slowly through your mouth as deeply as you can. As you take the breath, you will see the piston rise inside the large column. While the piston rises, the indicator on the right should move upwards. It should stay in between the 2 arrows (see Figure 1).
4. Try to get the piston as high as you can, while keeping the indicator between the arrows.
    - If the indicator does not stay between the arrows, you are breathing either too fast or too slow.
5. When you get it as high as you can, hold your breath for 10 seconds, or as long as possible. While you're holding your breath, the piston will slowly fall to the base of the spirometer.
6. Once the piston reaches the bottom of the spirometer, breathe out slowly through your mouth. Rest for a few seconds.
7. Repeat 10 times. Try to get the piston to the same level with each breath.
8. After each set of 10 breaths, try to cough, holding a pillow over your incision, as needed. Coughing will help loosen or clear any mucus in your lungs.
9. Put the marker at the level the piston reached on your incentive spirometer. This will be your goal next time.

Repeat these steps every hour that you are awake.

Postoperative Pain Management

Pain is an uncomfortable feeling that tells your body something has happened. Receptor nerve cells in and beneath your skin sense pain and send the message of pain to your brain. Pain medicine blocks these messages or reduces their effect on your brain. It is normal to experience pain after surgery.

Medications



After your surgery, you will be on special pain medicines to help keep you comfortable. Please be sure to tell your doctors and nurses if you know you are allergic to one of these medications. The Spine Hospital inpatient team works very hard to help make you as comfortable as possible while still keeping you safe. We have a dedicated team of Pain Nurse Practitioners that work with each patient to individualize your pain medication.

A special pump, called a Patient-Controlled Analgesia pump (PCA), will administer your pain medicine for the first 24 hours after surgery. This pump is at your bedside and you will be able to control the pain medicine. Only you are allowed to touch the button. Family members cannot press it for your while you're asleep, or you may become over sedated and experience trouble breathing. The nursing team makes sure your PCA is set up so you don't give yourself too much medicine.

You will then be transitioned to oral pain medication. This is the pain regimen that you will be discharged home with. The standard pain regimen includes, Oxycodone, Tylenol, Muscle Relaxer, and Gabapentin for nerve pain.

Please remember that during your hospital stay you will have a list of PRN or as needed medications. These medications will be for symptoms such as muscle spasms, nausea, indigestion, pain and itching. Please speak to the nurse taking care of you if you have any symptoms that are not being controlled so she can go over these medications with you.

Pain is a highly individual experience. Each patient is different. Most patients stop taking narcotic pain medication about 2 weeks after their surgery.

If you take any narcotic pain medication before surgery, please tell Dr. Lombardi and his team. This will help the team and you prepare for a safe and more comfortable recovery. Dr. Lombardi's team will likely connect you with the pain nurse practitioner before surgery to set up a plan. Please set up an appointment with your pain medication prescriber for 2 weeks after you're discharged from the hospital. Patients who have been on pain medication long term need close monitoring to manage these medications safely.

Do not take any anti-inflammatory medications for 4 months after surgery.

Postoperative Activities & Precautions

Spinal Fusion Precautions

After your spinal fusion you will need to follow spinal fusion precautions for 4 months after your surgery.
No Bending
No Lifting greater than 10-15 lbs
No Twisting
Your hips and your shoulders should move together. Physical therapy and Occupational Therapy will help you learn these precautions in the hospital.

Activities

Physical Therapy (PT) will work with you twice a day in the hospital on activity and ambulation.
Occupational Therapy (OT) will see adult patients postop and work on bathing/dressing/etc.



The hospital will provide you with a Spine Kit if needed

Turning in bed

You will be turned by the logrolling method. A sheet will be placed from your shoulders to your knees to help the nurses turn you as a unit. Hips and shoulders must move together. All of these exercises, turning, deep breathing and coughing help loosen the secretions in your lungs. Turning also prevents pressure sores. Tighten your stomach muscles. Bend your knees slightly toward your chest. Roll to one side, keeping your ears, shoulders and hips in line. Be careful not to bend or twist at the waist.

Getting out of bed

Tighten your stomach muscles. Turn onto your side. Push your body up with one elbow and the other hand. At the same time, gently lower both legs to the floor. Keep your stomach muscles tight.

Sitting

Sitting puts more pressure on your spine than lying down or standing. For the first several weeks, avoid sitting for long periods (not greater than 1 hour without getting up and moving around). When you do sit, use a firm, upright chair and change your position frequently. Stand up whenever your back feels tired or begins to hurt. Frequent position changes are the key.

To Stand Up

Scoot to the front of the chair. Brace your abdominal muscles and place one foot slightly in front of the other. Grasp the sides of the chair or the armrests for support. Push up with your arms and use your leg muscles to bring your body up. Keep your ears, shoulders, and hips in line.

To Sit Down

Back up to the chair until you feel the chair on the back of your legs. Brace your abdominal muscles, bend at the hips keeping your back straight and use your leg muscles to lower yourself onto the front of the chair. Then scoot back.

Standing and Turning

To help keep your spine balanced when you stand, imagine a cord running from your head to your hips. Keeping your ears, shoulders and hips in line keeps this "cord" taut and the three curves of your spine balanced. If you stand for a long time, change your position frequently by shifting your weight from one foot to the other. Turn your whole body as a unit.

Bending and Lifting

During the first four months, avoid bending or lifting anything weighing more than 10 pounds. When you lift something, keep it close to your body so that your leg and arm muscles do the work. Remember to brace your abdominal muscles, stoop at the hips and knees keeping your back straight and the three curves of your spine balanced. This will help prevent pain and further injury to your spine.

Sleeping

You may sleep on either side or your back. Please do not sleep on your stomach. Placing a small pillow between your knees while laying on your side will help maintain spinal alignment. You can also roll a pillow behind your back while laying on your side to support your back.

Walking

Walking is excellent exercise. Walking helps your pulmonary, cardiovascular and digestive systems. It also prevents blood clots from forming and it increases muscle strength and endurance. A wheeled walker will be used initially for adults in the hospital to improve your balance. By the time you go home you will be walking independently with or without the aid of an assistive device. Once you are home it is important to continue walking activities. Clear a path in your home for an imaginary track. Walk this track 6-8 times/day for at least 5 minutes, increasing every few days as tolerated. As your strength and endurance increases

Stairs

Your physical therapist will practice stairs with you before you go home. You should use a handrail when possible. Never use a walker on the stairs. Your therapist may have special instructions for you depending on your home environment and physical abilities.

Driving and riding in the car

The car should be mid-size or larger. You should sit in the front passenger seat slightly reclined and as far back as possible.

To enter the car

Walk up to the passenger door, turn and back up until you feel the car behind your legs. Reach back and place your left hand on the dashboard or car door and place your right hand on the back of the front seat. Bend your legs and gently sit down. Scoot hips back and slowly turn your body as you put your legs inside the car.

To exit the car

Gently turn your body while placing your legs outside the car. Scoot forward until your feet are on the ground. Push up to a standing position by placing your arms on the dashboard or car door and back of the seat.

Driving

Driving is generally permitted approx. 4 weeks after surgery, depending on the magnitude of your surgery. You should not drive while taking strong pain medications.

Dressing

Due to decreased flexibility and postoperative restrictions of back movement, it may be necessary to use some of your spine kit for putting on underwear, pants, shoes and socks. It is easier to dress sitting in a supportive chair using adaptive equipment to reach your legs. Wear loose-fitting clothes and slip-on shoes for the first several weeks.

Toileting



Low toilet seats can make regular toileting very difficult and unsafe for patients who have had back surgery. Depending on the type, location and surrounding area of your toilet, you may be instructed in using a bedside commode, raised toilet seat and/or toilet rails. Patients may experience difficulty reaching themselves to clean after toileting. The therapist may show you different techniques or adaptive equipment to assist with this task.

Bathing

Do not get your incision wet for 2 weeks after surgery. Most patients will be able to shower 2 weeks after surgery. Once the incision can get wet, you may stand in the shower or use a shower bench. To make washing easier, long handled bath sponges and hand held shower hoses are available.



The bathtub and/or shower stall are potential sites for accidents because of wet surfaces. Please shower while someone else is at home. Transferring safely to these areas, while adhering to postoperative precautions, may require safety equipment including bath rails or bath chairs depending on your bath area at home.

Tub baths are not allowed.

Other Tips to Protect Your Spine

- Bend your knees and stoop if you need to pick something up below hip level. Keep your back straight. Use your reacher if possible.
- You may find it easier to dress and undress sitting in a supportive chair with armrests. Follow instructions given by the Occupational Therapist using long-handled tools.
- Avoid pushing, pulling or twisting. Avoid lifting anything over 10 lbs.
- Walk to stay in shape and keep your spine healthy.

Incision Care

Your incision will be closed on the outside with a product call Dermabond Prineo. This is surgical tape and glue. You will have dissolvable sutures on the inside. Most patients do not need to return to have any sutures removed.

- Keep the incision clean and dry
- If the incision gets wet, pat it dry and let it completely dry before dressing.
- Look for signs and symptoms of infection. Redness, Swelling, Hot to the touch, Drainage or a Fever over 101*F.
- Email Clinical staff and Joy a picture of your incision at 2 week and 4 weeks post op. We want to make sure that your incision is healing properly.
- If you have any concerns about your incision anytime, please email Clinical staff and Joy a picture so she can see your incision and discuss it with you.
- The Dermabond Prineo will start to come off about 2weeks after surgery. If it hasn't come off by 3 weeks post op, please remove it.

Some patients will have a suture tail that will be left out to help their incision heal flat. If you notice a clear thread or pig tail on your back please leave it until 2 weeks post op. After 2 weeks post op, you can have a friend of family member clip it.

- Please wash your hands
- Clean the area with rubbing alcohol
- Snip the suture tail flush to the skin. The rest of the suture is under the skin and will dissolve with time.

If you are a patient with traditional sutures (stitches) on the outside of the incision. You will need to return to the office at a set date to have them removed. This will be indicated on your discharge paperwork.

The First 6 Weeks after Surgery

Expect to feel weak and tired when you first get home. You should feel a little stronger each day. Keep moving as much as you can without increased pain.
By about the sixth week, your back is well on its way to healing. If you're using correct posture and movements and exercising regularly, you should feel better and be able to do more each week.
Continue to let pain be a warning to slow down.

Preventing Setbacks

Increased pain for more than 2 hours after an activity usually means you've done too much too soon. Take pain as a warning sign to slow down and pay attention to your posture and movements. Make sure you're bracing your abdominal muscles and keeping your shoulders and hips in line.

Walking Program

Walking is the best exercise after back surgery. It strengthens your back and leg muscles and increases your endurance. It also relieves stress, which can cause the muscles in your back to tighten. You should take several (6 to 8) walks a day that are at least 5 minutes long. Brace your abdominal muscles and take medium strides.

Sexual Relations

You should generally wait until about 6 weeks after surgery. Lie on your back with the support of the mattress is preferable. Side-lying positions may be more comfortable since you won't bear any weight. Avoid arching your back. Avoid a lot of back motion or stress on your spine. Please maintain your BLT's. You will know best when you feel ready to resume sexual relations.

Pets

If you have pets you may need assistance to care for them after surgery. You will not be able to lift heavy bags of dog/cat food or bend down to the floor to fill their dishes. You will not be able to walk your dog using a leash for the first 4 months post op. It is very easy to trip over your pet if they are underfoot, fall down and possibly cause damage to your spine and instrumentation. Please make arrangements for assistance with pet care after your surgery.

Returning to work

Most patients return to their jobs about 2-6 weeks after their spinal fusion surgery. This will vary depending on the surgery and your job responsibilities.

Please send any leave or disability paperwork to Dr. Lombardi's team in advance of your surgery for completion. The team will need to know the following information in order to complete the paperwork

- Who the letter or paper work needs to be addressed to
- Where the paperwork should be sent
- When you are planning to return to work
- If you need any precautions or concessions indication in the paperwork. For example, do you need special permission to wear comfortable shoes).

POST-OP ACTIVITY SCHEDULE

	2 wks	1mos	4mos	6 - 7 mos	1 yr
Shower	yes				
Walking	yes				
Lifting 5 -10lbs	yes				
Driving	no	yes			
School/work	no	yes			
Light upper extremity exercise	no	yes			
Stationary Bicycling	no	yes			
Swimming - no diving	no	yes			
Shooting free throws, gentle tennis, volleying ball	no	no	yes		
Light jogging on even surface	no	no	yes		
Non-contact sports- no competitive play	no	no	no	yes	
Lifting 20 pounds	no	no	no	yes	
Bending forward while staying in control of your torso	no	no	no	yes	
Competitive sports/contact sports	no	no	no	no	yes/no
Skating (ice & roller)	no	no	no	no	yes
Skiing (snow & water)	no	no	no	no	yes
Bowling	no	no	no	no	yes
Horseback riding (no jumping)	no	no	no	no	yes
Roller coasters	no	no	no	no	yes
Gymnastics	no	no	no	no	no

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Spinal Fusion Discharge Instructions: For First Four Months

Spinal Fusion Precautions

After your spinal fusion you will need to follow spinal fusion precautions for 4 months after your surgery.
No Bending
No Lifting greater than 10-15 lbs

No Twisting
Your hips and your shoulders should move together.
Logrolling: This term describes how to turn as a unit. Here are a few pointers:

- Hips and shoulders need to be in alignment.
- Hips and shoulders should turn together as a unit.
- No twisting.
- A draw sheet (a sheet FROM SHOULDERS TO THIGHS) can be used to help you turn.
- Placing a pillow between your knees will help maintain alignment and provide comfort when lying on your side.

Wound Care

- Keep the incision clean and dry
- If the incision gets wet, pat it dry and let it completely dry before dressing.
- Look for signs and symptoms of infection. Redness, Swelling, Hot to the touch, Drainage or a Fever over 101*F.
- Email clinical staff a picture of your incision at 2 week and 4 weeks post op. We want to make sure that your incision is healing properly.
- If you have any concerns about your incision anytime, please email clinical staff picture so they can see your incision and discuss it with you.
- The Dermabond Prineo will start to come off about 2weeks after surgery. If it hasn't come off by 3 weeks post op, please remove it.

Some patients will have a suture tail that will be left out to help their incision heal flat. If you notice a clear thread or pig tail on your back, please leave it until 2 weeks post op. After 2 weeks post op, you can have a friend of family member clip it.

- Please wash your hands
- Clean the area with rubbing alcohol

- Snip the suture tail flush to the skin. The rest of the suture is under the skin and will dissolve with time.

If you are a patient with **traditional sutures (stitches)** on the outside of the incision. You will need to return to the office at a set date to have them removed. This will be indicated on your discharge paperwork.

Activity

Sitting

Do not sit for long periods of time (>1hr) without getting up and walking around.

Walking

Start out by walking for 5 minutes, 6 to 8 times a day and increase gradually. It is excellent exercise for your pulmonary, cardiovascular and digestive systems. Walking will help prevent blood clots and will increase/ maintain muscle strength. You may ambulate with an assistive device such as a wheeled walker or cane.

Pool therapy

Is encouraged after 4 weeks. You may get in a pool to walk or do gentle swimming once your Steri-Strips are off. No jumping/diving/horseplay. No lakes or rivers for 6 months postop. Oceans 6 months to get in the water but no wave jumping for 1 year.

Bathing

If your incision(s) look okay, you will be able to shower 2 weeks after surgery. No bending or stooping.
Tub baths are not permitted after surgery.

Driving

You may ride as a passenger whenever you feel you can tolerate this activity. You should sit in the front passenger seat, slightly reclined if possible. It is suggested that you start with short distances, or on longer trips allow breaks to stop and walk around. Driving is generally permitted approximately 4 weeks after surgery if you are off of the narcotic pain medication.

When riding home postoperatively, it is recommended that you stop every 1- 1 ½ hrs and get out of the car and walk in order to get your heart pumping and your blood circulating. This will help make the ride home more comfortable

Medications

- You will be given several prescriptions for pain medication when you are discharged. Take all medication as directed and wean off the narcotics gradually. If you were taking narcotics preoperatively, do not take those with the prescriptions given to you by Dr. Lombardi.
- Avoid taking too much Tylenol OTC label states that severe liver damage may occur if more than 4,000 mg of Acetaminophen is taken in a 24-hour period.
- Do not use any NSAIDs (Non-steroidal anti-inflammatory medications) such as Ibuprofen, Motrin, Advil, Aleve, Celebrex, etc. for a minimum of 4 months postop. These medications slow the fusion healing process. Tylenol is suggested once narcotics are no longer needed.
- You may resume your home medications after discharge except birth control pills, blood thinners and NSAIDs as above.
- Bone strengthening medication: Forteo may be resumed 1 week postop, Fosamax and Reclast may be resumed at 4 months postop.
- It is recommended that you wean your narcotic use slowly and not abruptly. If you are taking 2 narcotic tablets every 4 hours PRN, wean to 1 tablet every 4 hours, then 1 tablet every 5 hours and so on until you are able to stop narcotics all together. You may be given specific weaning instructions when you are discharged. Follow up with a pain management doctor if needed.

Gastrointestinal information: Bowel Protocol

- You will be given a prescription for a stool softener/laxative combination
- If it has been 3 days since your last bowel movement, increase the Senna-S to 2 tablets twice a day. (This is the maximum dose allowed.)
- If you do not have a bowel movement for 5 days, take MiraLAX as directed in addition to the Senna-S.
- If you have not had a bowel movement for 6 days, take a suppository as directed on packaging.
- If no bowel movement for 7 days postop use a Fleets Enema - dosing per package
- If this does not give you results, contact our office for further instructions.
- If at any time you are nauseated, have vomiting, abdomen is swollen and hard and/or you have severe abdominal cramping, please contact our office immediately.

GOING HOME

- Remember to take small, frequent walks on your imaginary home track.
- Move items frequently used to lower shelves in cabinets where they can be easily reached without bending, stooping or reaching.
- Your 6-8 week follow up appointment will be scheduled for you before you leave the hospital. The date and time will be on you discharge paper work. Please call the appointment desk at 212-932-5100, Option 1 if this is not good for you.

Returning to Work

- Most patients return to work about 2-6 weeks after their surgery. This may vary based on your surgery and your job responsibilities.

Post-Operative Appointments and Follow Up

Dr. Lombardi Post-Operative Appointment

Post op with Dr. Lombardi:

You'll be scheduled for a postop visit at approximately 4 weeks from surgery for your first visit which will require x-rays. If you have sutures, it will be 2 weeks.

GLOSSARY

Anterior: The front portion of the body. It is often used to indicate the position of one structure relative to another.

ALIF: Anterior Lumbar Interbody Fusion: a type of spine surgery used to fuse the disc space of the spine through entering the front of the body through the abdomen. In an ALIF, an incision is made on the left side of the abdomen and the abdominal contents and muscles are pulled to the side to allow access to the front of the spine. Disc material, which is located in the front of the spine, is then removed from in between the vertebrae to allow for the insertion of bone graft and/or anterior interbody cages into the disc space. Most times, the anterior (from the front) approach is performed first. By removing the disc material and cutting the anterior longitudinal ligament (which lays on the front of the disc space), the spinal segment is "released" and allows for a more complete reduction. After the anterior and the posterior spinal implants are inserted, this segment is much more stable than even a normal spine segment.

BMP: Bone morphogenetic protein. A genetically engineered bone substitute (protein) that helps your bones fuse. Used in combination with your own bone. BMP is not yet FDA-approved for all types of surgery, but surgeons may use the medicine for whatever application they feel is appropriate for the patient. This is called using it “off-label”. We are actively studying this medicine to see how effectively it works. Clearly all data and our experience show that it is very safe. Currently BMP is FDA-approved for use in the anterior spine with cages. Use of the product posteriorly is “off-label”.

Bone Graft: Bone that is harvested from one location in an individual and placed in another individual (allograft bone) or in a different location in the same individual (autogenous bone).

Cervical Spine: Seven spinal segments (C1-C7) between the base of the skull (occiput) and the thoracic spine.

Coccyx: The region of the spine below the sacrum, also known as the tailbone.

Corpectomy: The surgical removal of all or part of the vertebral body.

Decompression: This procedure is carried out to relieve pressure on the spinal cord or nerve roots. The pressure may result from fracture fragments, disc fragments, bone spurs, tumors or infections.

Decompression Laminectomy: A posterior approach decompression done by removing the lamina and spinous process.

Disc Degeneration: The loss of the fluid content, structure and functional integrity of the disc.

Discectomy: The excision of the intervertebral disc material that may be described as herniated, implying “bulging” or “ruptured” through the ligaments. If the central fragment of disc material has torn through a hole in the ligament, it is called an extruded fragment or extruded disc. The term herniated nucleus pulposus (HNP) is a catchall phrase for all of these conditions.

Facet: A posterior structure of a vertebra which articulates with a facet of an adjacent vertebra to form a facet joint that allows motion in the spinal column. Each vertebra has two superior and two inferior facets.

Flatback Syndrome/Fixed Sagittal Imbalance Syndrome: Forward posture usually due to a flattened lumbar spine from postoperative or degenerative changes. When viewed from the side, the patient's head may be several centimeters in front of their hips.

Foramen: An opening allowing for the emerging of spinal nerve roots between two vertebrae.

Foraminotomy: A procedure carried out in conjunction with disc surgery. The foramen (openings for the individual nerve roots to pass from the spine) may become narrowed because of disc impingement, intervertebral collapse, and spondylolisthesis. The surgical widening of the foramen is an attempt to relieve the pressure on the nerve roots.

Fusion: The uniting of two bony segments together to remove motion, relieve pain and prevent deformity progression.

Gardner-Wells tongs: A device used to position the head or apply traction to the neck during surgery. The tongs are attached to your skull with a screw above each ear after you are asleep in surgery.

Hemivertebra: A congenital abnormality of a vertebral body. Usually a wedge shape which causes scoliosis or kyphosis.

Idiopathic: Unknown cause. No evidence of underlying physical or radiographic pathology. The most common type of scoliosis.

Iliac Bone: A part of the pelvic bone that is above the hip joint. Using iliac bone graft is not commonly done anymore.

Internal Fixation: The immobilization of bone fragments or joints with implants (metal screws, rods, etc.) in order to promote healing or fusion.

Interspinal or intervertebral disc: The structure that normally occupies the space between two moving vertebrae. It is more prominent in the cervical and lumbar spines. It is much like a radial tire. The centermost portion of the disc (nucleus pulposus) is normally composed of a clear gelatinous material that varies in consistency from a firm jelly material to a very thick and less pliable substance. This core is then surrounded by numerous layers of fibrous (fibrocartilaginous) material called the annulus fibrosus. That structure goes to the normal margins of the vertebral body. There is a thick ligament (approximately 2mm) that covers the anterior part of the vertebral body called the anterior longitudinal ligament, and on the spinal canal side posteriorly is the posterior longitudinal ligament.

Kyphosis: The normal forward curvature of the thoracic spine. The condition "kyphosis" refers to an abnormal increase in this forward curvature.

Lamina: An anatomical portion of a vertebra. For each vertebra, two laminae connect the pedicles to the spinous process as part of the neural arch.

Laminectomy: An operation for removal of part or all of the lamina of a vertebra commonly performed in order to be able to remove an intervertebral disc protrusion or to decompress a nerve root.

Lordosis: The normal mild "swayback" curve of the lumbar spine.

Lumbar spine: Five mobile segments of the lower back (L1-L5). These are the largest of the vertebral segments and provide most of the bending and turning ability of the back, in addition to bearing most of the weight of the body.

Nerve Root: The portion of a spinal nerve in close proximity to its origin from the spinal cord.

Oblique Lateral Interbody Fusion (OLIF): Allows the spine surgeon complete minimally invasive solution for the treatment of degenerative lumbar conditions. This allows placement of a large interbody graft into the disc space. Patient is positioned on the left side. Incision is made on the abdomen to the left side the blood vessels, muscles and tissues are moved to the side. This will allow access to the spine from the front of the body. Spine surgery from the front will allow for additional stability to the fusion. A cage and bone graft is inserted into the disc space to maintain disc height and increase the chances of fusion. The anterior or "from the front" approach will be done first. Once completed, the patient is turned and the posterior portion of the surgery is done if indicated by Dr. Lombardi.

Osteotomy: The surgical removal of a wedge or piece of vertebral bone to alter the alignment of the spine. Examples would be a Smith-Petersen osteotomy (SPO) and a pedicle subtraction osteotomy (PSO).

Pedicle: The part of each side of the neural arch of a vertebra that connects the lamina to the vertebral body.

Pedicle Subtraction Osteotomy (PSO): Reshaping the entire vertebra to provide marked deformity correction for stiff and large curves. The prototype of a PSO is to treat lumbar flatback syndrome.

Posterior: Located behind a structure, such as relating to the back side of the body.

Pseudarthrosis: An area of the spinal fusion where the bone did not heal (fuse). Often found with broken instrumentation and, in some instances increased pain, although not always.

Sacral spine (sacrum): The five fused segments of the lower spine that connect to the pelvis and have four foramen on each side.

Sciatica: A lay term indicating pain along the course of a sciatic nerve, especially noted in the back of the thigh and below the knee.

Scoliosis: Lateral (sideways) curvature of the spine. Rotation of the vertebrae also occurs which produces the rib cage asymmetry.

Smith Petersen Osteotomy (SPO): Removal of bone and ligaments from the back of the spine, usually at multiple levels to allow for increased deformity correction at these levels. Very commonly performed.

Spinal Canal: The long canal between the vertebral bodies anteriorly and the lamina and spinous processes posteriorly through which the spinal cord passes. The spinal cord and nerve roots extend to the level of the second lumbar segment in adults. Below this level are numerous nerve roots from the spinal cord that resemble a horse's tail and is referred to as such (cauda equina). The thick outer covering of the spinal cord is called the dura.

Spinal Fusion: A surgical procedure to permanently join bone by interconnecting two or more vertebrae in order to prevent motion.

Spinal Stenosis: Reduction in the diameter of the spinal canal due to arthritic overgrowth of bone and soft tissue, which may result in pressure on the spinal cord or nerve roots.

Spinous Process: The portion of the vertebrae that protrudes posteriorly from the spinal column. The spinous processes create the "bumps" felt on the midline of the back.

Spondylolisthesis: A defect in the construct of bone between the superior and inferior facets with varying degrees of displacement so the vertebra with the defect and the spine above that vertebra are displaced forward in relationship to the vertebrae below. It is usually due to a developmental defect or the result of a fracture.

Spondylolysis: (also referred to as a stress fracture or a pars fracture): Fracture of a posterior portion of the vertebra. A defect in the neural arch between the superior and inferior facets of vertebrae without separation at the defect and therefore no displacement of the vertebrae. It may be unilateral or bilateral and is usually due to a developmental defect but may be secondary to a fracture.

Thoracic (dorsal) spine: Twelve spinal segments (T1-T12) incorporating the 12 ribs of the thorax. Other than a slight increase in size from top to bottom, they are fairly uniform in appearance.

Transforaminal Lumbar Interbody Fusion (TLIF): is a procedure that fuses the anterior and posterior columns of the spine through a posterior approach. A bone graft and interbody spacer (cage) stabilize the anterior portion while the posterior is locked in place with pedicle screws, rods and bone graft.

Transition Syndrome: A degenerative change with bony instability above or below a previous fusion.

Vertebra: One of the bones of the spinal column. A cervical, thoracic, or lumbar vertebra has a cylindrically shaped body anteriorly and a neural arch posteriorly (composed primarily of the laminae and pedicles as well as the other structures in the posterior aspect of the vertebra) that protect the spinal cord. The plural of vertebra is vertebrae.

Vertebrectomy or Vertebral Column Resection (VCR): Removal of the whole vertebra to facilitate more correction of the spine, done usually through an all posterior approach.

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Spine Rehabilitation: Multilevel Fusion

Treatment Protocol Guidelines

Phase I: 0 - 8 Weeks

Initial Surgical Site Protection

Goals:

- Improve Neural Mobility
- Improve flexibility of extremities and symmetric ROM of lower extremities
- Reeducation of global stabilizers. Early rehab on gluteal muscle group
- Establish neutral lumbar spine with extremity motion
- Assess and improve mobility and strength of Cervical and Thoracic Spine
- Continue control of pain and inflammation

Precautions:

- Do not push through pain
- No Bending, Lifting, or Twisting for 4 months
- Prevent spinal loading and lumbar ROM
- Progression relative to soreness protocol
- Low load high repetitions to improve endurance rather than high load for strength

Treatment:

- Assess and improve flexibility of lower extremities
- Assess and correct gait deviations.
- Assess and improve Multifidus contraction timing and endurance in neutral spine
- Symptom free neural mobilization
- Aerobic conditioning: Treadmill 30 min/day, bicycle (upright or recumbent) after week 4,
- Isometrics of abdominals, gluteals and quadriceps before progressing to open chain activities.
- Commence balance activities
- Progress spinal stabilization as able to incorporate UE motion into flexion, hip fall outs, heel slides,
- Hip Mobility: Bent fall out, standing open chain hip rotation
- Open chain exercises: Resisted ankle pumps, SAQ, LAQ, side lying clamshell progression, scapular retraction, lower/middle trapezius
- Closed chain lower extremity progressions: mini squats, sit to squat.

Criteria for Progression:

- Aerobic tolerance to 30 mins /day
- Static balance with proper form > = 30 seconds each leg
- Ability to perform above spinal stabilization exercises while also maintaining neutral spine

Phase II: 8 – 12 weeks

Goals:

- Improve Neural Mobility
- Improve flexibility of extremities
- Improve positional tolerance in sit and stance
- Establish neutral lumbar spine with extremity motion.
- Improve Hip Mobility
- Assess and improve mobility and strength of Cervical and Thoracic Spine.
- Continue control of pain and inflammation

Precautions:

- Spinal loading avoidance
- Spinal flexion, rotation and extension motion

Treatment:

- Assess and improve flexibility of lower extremities
- Assess and correct gait deviations.
- Assess and improve Multifidus contraction timing and endurance in neutral spine in supine, side lying, and or quadruped positions
- Push Up progression starting in stance of wall progressing degree of incline as lower to floor pushups.
- Quadruped progression for stabilization and hip mobility (i.e. sit backs no spinal motion) and gluteal strengthening
- Hip mobility progression from Phase I with adequate spinal stabilization
- Symptom free neural mobilization.
- Aerobic conditioning: Upper Body Ergometer standing, treadmill, recumbent bike beginning post op week 4
- Gait training with stepping pattern in sagittal and frontal planes
- Balance activities
    1. Progress spinal stabilization as able to incorporate UE motion into flexion, hip fall outs, heel slides, walk outs, kick outs, dying bug
    2. Closed chain lower extremity progressions: wall slides, mini squats 0-60* with progression to 45* with UE assistance, sit to squat, anterior lateral lunges
    3. Stretching: heel chord with knee extension and flexion, knee to chest, active hamstrings slowly and without symptoms, gentle quadriceps and TFL
    4. Commence Kinesthetic and proprioceptive training including joint positioning with and without visual input: joint positioning. Include a progression of symmetrical reaching in half kneel to high kneel to stance, In stance can progress to reaching for cones in star pattern.

5. Rhythmic stabilization of extremities with core control and of trunk in progressing supported positions to more challenging postures.

Criteria for Progression:

Aerobic tolerance to 30 mins /day

Dynamic sitting and standing tolerance of 30-60 mins.

Static balance with proper form > = 30 seconds each leg

Phase III: 12 weeks +

Goals:

- Advanced stability and trunk control progressed to transverse plane
- Progress strengthening and flexibility in functional postures and movement patterns utilizing hip mobility with spine stability
- Commence introduction to sports specific movement patterns low levels, shorter time periods

Precautions:

- Pain and inflammation controlled
- Progression relative to soreness protocol
- Low load high repetitions to improve endurance rather than high load for strength

Treatment:

- Functional strengthening and re-education of lumbar stabilizers transverse abdominus and multifidi
- Progress core stabilization to include lifts and chops.
- Progress push up and prone stabilization incorporating physio ball, foam rollers, etc.
- Progress return to sport activities including short burst low load high repetition specific activities
- Increase challenge and demands to balance and balance reactions
- Increase/improve aerobic capacity to include elliptical, stepper, jog on treadmill.
- Assess and correction thoracolumbar junction mechanics and mobility.
- Progress stretching for hip flexors and gluteals, adductors.

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Preoperative Halo Traction



Occasionally for very severe or stiff curves, preoperative traction is recommended to help “loosen” the spine while letting the spinal cord slowly and safely accommodate the stretching process. The goal of traction is to improve the ultimate correction of the deformity during surgery.

Patients are in traction for various lengths of time ranging from a couple weeks to several months in the most severe cases. Traction is used 23 out of 24 hours a day. You will be set up with a traction equipped bed, wheelchair and walker. This equipment is designed to allow you to be up and about while taking the traction with you. You may come out of traction to take a shower with the halo on.

Halo Traction is applied during a short surgery under general anesthesia, screws are attached to the skull and a halo ring is attached to the screws. Traction will start the day after the halo is placed. Generally, we start with 2-3 pounds the first day and increase by 2-3 pounds daily until maximum weight is achieved which ranges from 20-40 pounds.



While in traction, patients will do aggressive respiratory and physical therapy to improve their pulmonary status and overall conditioning preoperatively. Patients may experience a headache for the first day or so but generally don’t complain of pain while in traction. Most patients actually feel better in traction as this “stretching” unloads the spine and makes it easier to breathe and digest food.

The halo traction is also used during surgery to maintain the correction obtained and will be removed at the end of surgery.

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What to Expect at Rehab

Most patients are discharged home to the care of their friends and family. The physical therapist who sees you during your hospital stay will make recommendations for your rehabilitation. This is based on your progress while you're in the hospital. If you are struggling with mobility in the hospital, they will likely recommend an acute inpatient rehabilitation stay. The physical therapist and the social worker will work with you to get you set up in a program.

Throughout the rehabilitation stay, the patient practices self-care skills, transfers and ambulation with the spine rehabilitation staff. Family members should get involved in assisting as applicable while the patient is in Rehab to increase comfort with these activities after discharge. After an initial evaluation the patient is scheduled for occupational and physical therapy twice each day.

A team of rehabilitation physicians makes rounds daily to check on incisions, monitor pain control, evaluate progress and observe patients during therapy sessions. Any changes in the patient's condition and rehabilitation progress are regularly communicated to the patient's orthopedic surgeon.

The patient's progress is discussed weekly at the spine team meetings. Both the patient and the family are given a summary of the team report.

The Social Worker/Case Manager makes all the necessary discharge arrangements based on recommendations of the physician and Spine Rehabilitation Team. Prescribed equipment such as a wheelchair, walker or cane is delivered to the patient prior to discharge.

What to Bring:

- Loose fitting washable slacks or shorts (preferably with an elastic waistline) and other casual clothes.
- Laundry detergent in case clothes need to be washed.
- Comfortable walking shoes with non-slip soles and no heels.

The Spine Rehabilitation Team will do everything possible to facilitate the patient's functional recovery and assist with a smooth transition to the home and community.

Wake-Up Test

After your surgery, you will be asked to perform several maneuvers that will test your neurological function. IF there is an issue with neuro monitoring during your surgery, Dr. Lombardi and his OR team will ask you to perform these moves during the surgery. You should not feel any pain and most patients do not remember it. Since you will be under the influence of anesthesia, it is important that you are familiar with what will be requested of you prior to your surgery.

Please practice the following with the assistance of a family member: (repeat steps with both legs)

- "PUSH DOWN ON THE GAS PEDAL" With someone holding under your foot, push down as if you are stepping on the gas pedal.
- "POINT YOUR TOES TO YOUR NOSE" With someone holding on the top of your foot, pull up against their hand.
- "STRAIGHTEN YOUR KNEES" Hold your leg straight and elevated off the bed. Have someone try to bend it at the knee – don't let them bend it.
- "PUSH OUT WITH YOUR KNEES" Have someone hold their hands outside your knees and gently push in. Try to push your knees out against them.
- "PUSH IN WITH YOUR KNEES" Have someone hold their hands inside your knees and gently push out. Try to push your knees in against them.
- "BEND YOUR KNEES" Have someone hold their hand on your knee and gently push down. Try to bend your knee up against them.
- "SQUEEZE MY HAND" Have some one place their hand in yours. Squeeze their hand with yours
- "MOVE YOUR FEET AND TOES UP AND DOWN" Wiggle your toes up and down.