



Spine Surgery Patient Guide: Your Path to Recovery

Information about your procedure and rehabilitation

Welcome to the NorthShore University HealthSystem Spine Center

Your decision to have your spine surgery performed by a NorthShore University HealthSystem (NorthShore) expert surgeon provides you with a unique opportunity to partner with your doctor and the other healthcare professionals who will be part of your successful surgical recovery.

At the NorthShore Spine Center, our doctors and staff are trained to address your unique needs. Our multidisciplinary team has created a “pathway” that will guide you every step of the way, including preoperative preparation and education, coordination of hospital care and postoperative rehabilitation. Your pathway begins with a class for you and anyone else who will be assisting you through your surgical preparation and recovery. You have been assigned a day for class and preoperative testing.

This book is designed to provide you with important information that will guide you through the surgical process. It is your workbook. Please bring this book with you to the hospital for reference and further guidance.

Your involvement is very important to our team. We look forward to partnering with you for a successful surgery and recovery. Thank you for choosing the NorthShore Spine Center.

If you have any questions, please contact the Spine Center at (847) 35-SPINE.

The NorthShore Spine Center



Key Patient Information

Patient Name: _____

Date of Surgery: _____

Preoperative Tests and Appointments

Name of Test/ Appointment	Date	Time	Location
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

List of Medications You Are Currently Taking

Notes and Questions

If you have any questions, please contact the Spine Center at (847) 35-SPINE.

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Spine Center Team

The Spine Center team assembled for your care before, during and following your surgery consists of:

Spine Surgeons

Residents/Fellows

Physician Assistants

Physiatrists

Nurses

Physical Therapists

Occupational Therapists

Social Workers

The specialized group of professionals at the Spine Center have developed a comprehensive treatment plan that involves patients in their treatment. Every detail is considered to help guide you in every step of the process. The Guidebook provides information to help maximize a safe and successful surgical experience. Preparation and education will help you understand what to expect, what you need to do and how to care for yourself after surgery.

The spine surgeon and the physician assistant will examine you, provide a diagnosis and share their surgical recommendation. The surgeon and his or her team will perform the surgery, see you in the hospital, and coordinate your care and recovery. The Spine Center team will provide your preoperative education, assist with scheduling your surgery, and answer your questions and concerns before and after surgery. The inpatient nurses will provide care while you are hospitalized. Physical therapists and occupational therapists will work closely with you to accomplish daily goals approved by your surgeon immediately following your surgery, and will continue to work with you after you are discharged from the hospital as determined by your surgeon.

Preparing for Surgery

Preoperative Workup

Most arrangements for the tests will be made through either the NorthShore Spine Center or your doctor's office.

- | | |
|---|---|
| <input type="checkbox"/> Laboratory tests | <input type="checkbox"/> History/physical examination |
| <input type="checkbox"/> X-rays, MRIs, CT scans | <input type="checkbox"/> Nasal swabs |
| | <input type="checkbox"/> Other evaluations, as needed |

Preoperative Nasal Swabs

NorthShore has evidence-based protocols to protect you from developing an infection following your surgery. Specific bacteria—called *Staphylococcus aureus*, or Staph—are organisms that may cause an infection following an operation. Patients who are most likely to get an infection carry these organisms in or on their body without symptoms before surgery. Without precautions, these organisms can unknowingly get into a Staph carrier's surgical incision following surgery.

Before your surgery date, hospital staff will collect cultures from you to check for Staph by swabbing the inside of your nose with small, sterile swabs.

If your nasal swab is positive and you are a Staph carrier, your doctor's nurse or medical assistant will call you to obtain your pharmacy phone number to prescribe a nasal ointment for use prior to surgery. You will need to place a pea-sized portion of the ointment inside each of your nostrils twice a day for five days.

It is best if the last dose is administered the morning of the surgery. However, if you cannot complete the full five days prior to surgery, you may continue and finish the medication after your surgery date. Even just a few doses have been shown to be of benefit. Once the Staph is treated with the nasal ointment, you are usually Staph-free for approximately four to six weeks or longer. However, having been a Staph carrier, it is more than likely you will become a Staph carrier again in the future.

Write down any questions you may have for your doctor or nurse:

Preparing for Surgery

Home Health—Insurance Verification

You may require home health care when you return home after your spine surgery. The choice of a home health provider is yours to make. There may be some restrictions based on your insurance coverage, which you can determine prior to surgery by contacting your insurer. Once you have selected a home health provider, you can contact that provider to arrange care and verify insurance. If you have not selected a provider, NorthShore’s continuity-of-care planners or home health liaisons can assist you with arrangements following surgery.

One of your choices for continuing care is NorthShore Home Health Services, which is certified by the Joint Commission and has been awarded the prestigious Magnet designation for excellence in nursing. We provide service to the entire Chicagoland area. For more information, to schedule care or to verify your insurance coverage, please call us at (847) 475-2001 and ask for the intake department.



Write down any questions you may have for your doctor or nurse:

Preparing for Surgery

Home Safety Evaluation

Setting up your home prior to surgery is an essential step to ensure a safe environment after discharge from the hospital. Listed below are questions to consider BEFORE SURGERY while setting up your home.

Not all patients need every piece of equipment. Your occupational therapist will assist you with recommending the appropriate equipment as needed.

Stairs

- Are there railings on both sides of the stairwell, or just one side?
- Do you have stairs to get into/out of your home?
 - Having a family member/caregiver present to assist you into/out of your home is highly recommended.

Bathroom

- Do you have a tub or a stand-up shower?
 - If you have a tub, it is recommended that you get a tub transfer chair to ensure safety while bathing.
 - If you have a stand-up shower, it is recommended that you get a shower chair to ensure safety while bathing.
- Do you have grab bars in the shower?
 - Grab bars can be installed to increase safety in the tub/shower.
- How high is your toilet seat?
 - For standard toilet seat heights, it is recommended that you get an elevated commode seat to ensure safety with transfers to/from the toilet.

Bedroom/Living Room

- Is your home arranged for ease of movement once you return home?
 - It is recommended that you remove throw rugs and other obstacles from the floor to ensure safety while walking.
- Are items in cabinets and dresser drawers easily accessible?
 - You should not be on step stools or ladders after discharge, so be sure to move items as necessary so you can reach them easily (not too high and not too low).
- How high is your bed?
 - Be sure to let your therapist know the approximate height of your bed so he or she can help you practice bed mobility with a bed height more realistic to your home setup.

Children/Pets

- Do you have small children or pets?
 - Small children may need some education on how to interact with you in a way that ensures their safety and yours.
 - Take steps to ensure that your pet does not try to jump on you or bump you while walking.
 - Restrictions such as no bending or lifting can make it difficult to care for small children as well as caring for some large, active pets. You may want to have some assistance for a short time after surgery and prepare in advance.

Preparing for Surgery

Assistive Devices

Listed below are a few of the assistive equipment items commonly used following spine surgery. These items are helpful but not necessary to purchase. Not all patients will use every piece of equipment. An occupational therapist will assess your need for adaptive equipment during your hospital stay and provide recommendations based on your needs. These items are available from most area drugstores as well as Community Lending Closets. A list of area Community Lending Closets can be found in the back pocket of this book.

Shoes

As you will be unable to bend over to tie your shoes following surgery, rubber-soled slip-on shoes are recommended. Elastic shoelaces or Velcro shoe closures may also be used to make gym shoes more easy to slip on.



Dressing

The following adaptive equipment to help you dress and bathe will help you maintain the proper precautions:

- Sock aid
- Shoehorn
- Reacher/grabber
- Long-handled bath sponge
- Elastic shoelaces



Sock aid



Shoehorn



Reacher/grabber



Long-handled bath sponge



Elastic shoelaces

Preparing for Surgery

Family Member/Caregiver Support

A family member, close friend or other designated caregiver will become an important member of your extended team to help you prior to surgery and throughout your recovery. Please review this book with your family members/caregivers prior to surgery. Also, remember to introduce these individuals to your doctor.

Please invite your family member/caregiver to attend a physical therapy (PT) or occupational therapy (OT) session following your surgery. These family members/caregivers also will help with:

- Transportation to and from the hospital
- Providing support around the home during the first week after discharge
- Meal planning

Medications

Some medications you currently take may prove harmful during surgery because they thin your blood and increase the risk of excessive bleeding during and following surgery. If you take medications that contain aspirin, anti-inflammatory medications (such as ibuprofen, Motrin, Advil, Aleve, etc.), blood thinners (such as warfarin) or arthritis medications, ask your surgeon when you should stop taking these medications. During your visit with your primary care physician for your history and physical, your medications will be reviewed. You will be instructed on which medications you must stop taking before surgery and how long you need to wait following surgery to resume taking them.



Write down any questions you may have for your doctor or nurse:

Preparing for Surgery

Preoperative Nutrition

Low-Fiber/Low-Residue Diet for the Day Before Surgery

The day before your surgery, you can follow a low-fiber/low-residue diet to reduce the amount of undigested materials passing through the intestines. Limiting the kinds of fruits, vegetables and dairy consumed the day before surgery will limit residue in the digestive tract before surgery. This diet is only recommended for the day before surgery.

Recommended Foods

Milk and dairy products: You may have up to two cups of smooth milk products a day. This includes yogurt, cottage cheese, milk, pudding or creamy soup, or up to 1.5 ounces of hard cheese. Avoid milk products with nuts, seeds, fruit or vegetables added to them.

Breads and grains: You may have refined white breads, dry cereals (such as Special K, puffed rice, Corn Flakes and Rice Krispies), white pasta and crackers. Make sure these foods have less than half (0.5) a gram of fiber per serving. Do NOT eat whole-grain breads, crackers and cereals, whole-wheat pasta or brown rice the day before surgery.

Vegetables: You may eat the following vegetables raw: lettuce, cucumbers, onions and zucchini.

You can eat most well-cooked or canned vegetables without seeds and skin. Vegetables such as green beans, asparagus tips, carrots, pureed spinach and potato without skin are recommended. You also may drink juices made from the following vegetables if they do not contain seeds or pulp: yellow squash (without seeds), spinach, pumpkin, eggplant, potatoes without skin, green beans, wax beans, asparagus, beets and carrots.

Do NOT eat vegetables raw that are okay to eat cooked. Avoid vegetables and sauces with seeds, such as tomato sauce. And do NOT eat popcorn.

Fruits: You may have fruit juices without pulp and many canned fruits or fruit sauces, such as applesauce. Raw fruits you may have include very ripe apricots, bananas and cantaloupe, honeydew melon, watermelon, nectarines, papayas, peaches and plums. Avoid all other raw fruit.

Other fruits to avoid include canned or raw pineapple, fresh figs, berries, all dried fruits, fruit seeds, and prunes and prune juice.

Protein: You may eat cooked meat (including bacon), fish, poultry, eggs and smooth peanut butter. Make sure your meats are tender and soft, not chewy with gristle. Avoid deli meats, crunchy peanut butter, nuts, beans, tofu and peas.

Fats, oils and sauces: You may eat butter, margarine, oils, mayonnaise, whipped cream, and smooth sauces and dressings. Smooth condiments are okay.

Do NOT eat very spicy foods and dressings. Avoid chunky relishes and pickles.

Limit alcohol and caffeine intake to avoid dehydration.

Preparing for Surgery

Important Things to Do

- 1. Schedule a preoperative physical with your primary care physician at NorthShore.** Your physician will review and/or conduct any appropriate diagnostic tests, which may or may not involve other specialists. The goal is to ensure optimal physical condition before your surgery. Presurgical testing should be scheduled 14 days before surgery for routine diagnostic tests used to clear you for surgery.
- 2. Discontinue taking fish oil supplements one week before surgery. Anti-inflammatory medicine and nutritional supplements**—including vitamins, minerals, herbal supplements, iron and calcium—also should be discontinued one week before surgery. Unless you are informed otherwise, continue taking medications already prescribed by your physician.

Consult your physician regarding aspirin products or other blood-thinning products.
- 3. Attend your assigned preoperative patient education class.**
- 4. Some people bank their own blood a few weeks before they have surgery.** If a blood donation is recommended before your surgery, your surgeon's team will give you more information and help arrange an appointment for you.
- 5. Try to stop smoking.** The use of nicotine products, including both cigarettes and cigars, has been linked with an increased risk of complications following surgery. Your physician can provide you with resources to help you quit smoking.

If you have any questions or concerns regarding your preoperative instructions, please discuss them with your surgeon.

Write down any questions you may have for your doctor or nurse:

Preparing for Surgery



Write down any questions you may have for your doctor or nurse:

The Day Before Surgery

Preoperative Phone Call

A nurse will call you between 8 a.m. and 5:30 p.m. the day before your surgery to confirm your procedure and review your medical history, medications, allergies, etc. He or she also will provide directions to the hospital and confirm your arrival time to Ambulatory Surgery.

Also, during this phone call you will be instructed to avoid all food and liquid after midnight the night before surgery. You will be told which medications you should take the morning of surgery with a small sip of water.

DO NOT eat or drink anything (including water) after midnight the night before your surgery.

What to Bring to the Hospital

Things to bring or do:

- Advanced directives
- A list of your current medications
- CPAP machine, eye drops or inhalers (as directed)
- Wear loose-fitting clothing
- Bring a change of clothes (loose fitting)

Your physician has requested that you wear “street clothes” attire as soon as possible (following surgery) in order to facilitate rehabilitation.

Women, please bring the following:

- Loose shorts/pants, T-shirt tops
- Loose undergarments
- Slip-on shoes
- Short robe or pajamas
- Toiletries
- Street clothes

Things **not** to bring or do:

- Valuables that are not essential during your stay
- Medications from home—except eye drops or inhalers

Men, please bring the following:

- Loose shorts/pants, T-shirt tops
- Loose undergarments
- Slip-on shoes
- Robe or pajama bottoms
- Toiletries
- Street clothes

The Day of Surgery

Check-In at Ambulatory Surgery

Family members/caregivers are allowed to remain with you.

Following your check-in at Ambulatory Surgery, the process to prepare you for surgery will begin. You will begin meeting various members of your care team, including your surgeon, anesthesiologist, neurophysiology technicians, operating room nurses, and others who are committed to helping you through your surgery and beyond to a successful recovery. You will become accustomed to being asked your name, birth date and confirmation of the surgery you are having as part of our patient safety procedures.

For Your Safety

Verification

- You will be asked your name and birth date frequently.
- Prior to surgery, you also will be asked many times what procedure you are having done.

Medication Reconciliation

Prior to administering medications, we need to know:

- The name of all medications you currently take.
- The dosage of each medication.
- The frequency of your medications (how often you take them).
- When your last dose was taken.

Infection Prevention

- An antibiotic will be given before surgery and continued afterward for as long as your surgeon feels it is necessary.

Write down any questions you may have for your doctor or nurse:

The Day of Surgery

Preoperative Holding

Family members/caregivers can view your progress on the waiting room monitor. You will be in the preoperative holding area where you will stay for one to three hours.

During that time, the following will occur:

- Your health history and physical examination results will be reviewed.
- Advanced directives will be noted.
- Your operative site will be prepped.
- Your anesthesiologist will review your health history and physical exam results and will discuss your options for anesthesia with you.
- An IV (intravenous) line will be started.
- The surgeon will review the spine procedure with you and mark the site of surgery on your body.
- In some cases, a neuromonitoring technician may apply electrodes to your arms and legs for spinal cord monitoring intraoperatively.

Write down any questions you may have for your doctor or nurse:

The Day of Surgery

Anesthesia

The Department of Anesthesiology at NorthShore has prepared this brief informational section to help you understand the anesthesia and pain-relief options available to you for your spine surgery.

The Anesthesia Care Team

At NorthShore, anesthesia care is directed by board-certified anesthesiologists. You will meet your care team members in the preoperative holding area near the surgical suite. We work together to provide you with a safe anesthetic experience.

Preoperative Preparatory Work

Preparatory work for your surgery begins in the preoperative area. An IV (intravenous) line will be started, and an initial set of vital signs will be taken. Your anesthesia care team will review your medical history and laboratory reports and perform a brief physical exam. After discussing your various anesthetic options with you, your anesthesiologist will formulate a specific anesthetic plan.

Intraoperative Anesthesia Alternatives

The type of anesthesia used will be guided by your medical history, your preferences and the planned surgical procedure.

General Anesthesia

General anesthesia will put you to sleep following an injection of medications into your IV. After you are asleep, a breathing tube will be placed into your mouth to assist your breathing during the surgery. During the operation, you will be receiving additional medications in your IV and through your breathing tube. This will ensure that you remain asleep throughout your surgery. At the end of the operation, the breathing tube will be removed when appropriate.

Pain Medications

As part of NorthShore's multifaceted pain management program, you will be offered oral or IV medications to help with pain management before and after your operation. They are to be taken in addition to the other medical regimens described above. Should you have additional pain medication needs, you may be offered a patient-controlled analgesia (PCA). A PCA is intravenous pain medication given via an adjustable pump at your bedside that you control with a push button.

Risks

Anesthesia is very safe, but it does have recognized risks and complications. At the time of your surgery, your anesthesia care team will discuss the anesthetic risks with you in detail.

Our goal at NorthShore is to provide you with a safe and comfortable experience.

The Day of Surgery

Operating Room and Post-Anesthesia Care Unit (PACU)

Family members/caregivers can view your progress on the waiting room monitor.

Operating Room

Inside the operating room, you will be cared for by doctors, nurses and skilled technicians. The total time required for surgery differs from patient to patient depending on the complexity of the procedure. Spine surgeries may be short in duration, but many may last for several hours.

While you are in the operating room, your family can monitor your progress on a screen located in the waiting room. For privacy, you will be identified by a unique identification number, which will be given to your family members/caregivers.

PACU (Recovery)

Following surgery, you will be transported to the Post-Anesthesia Care Unit (PACU) or recovery room. You may feel groggy from the anesthesia. You will spend from one to three hours in the PACU while you recover from the effects of anesthesia.

- Nursing staff will monitor your:
 - Vital signs
 - Progress as you emerge from anesthesia
 - Pain, and provide interventions, as necessary
- Your surgeon will meet with your family members/caregivers to provide a postsurgery recap.
- Once your recovery is successful and the effects of the anesthesia have subsided, you will be transported to the nursing unit. Your family members/caregivers can visit you after this point.

Outpatient Spine Surgical Procedures

If your procedure is an outpatient procedure, after your recovery in the PACU, you will be transported to ambulatory surgery until you are discharged. Your family members/caregivers can stay with you until discharge.

Depending on how long you are in the hospital, your nurse or physical therapist will assist you to stand, walk and review how to properly change positions. You will be provided postoperative instructions for taking care of yourself at home and a prescription for pain medication. Your nurse will review instructions and precautions at discharge.

Your Hospital Stay

The Nursing Unit

Family members/caregivers are allowed to visit with you.

After your recovery in the PACU, you will be transferred to the inpatient nursing unit. Your stay on this unit will begin the postoperative/rehabilitation phase of your recovery.

You will have a bandage covering the incision on your spine. You also will have a urinary catheter and will receive antibiotics. Your nursing team will monitor your vital signs and give you medications to alleviate pain and nausea and to prevent blood clots. You will be introduced to therapists who will work with you individually to help you begin your exercise routine and instruct you on precautions following surgery.

Nursing Assessments and Interventions

Nursing assessments and interventions will include:

- Monitoring your vital signs frequently, including throughout the night.
- Monitoring and recording output from surgical site drains.
- Checking your incision.
- Administering IV fluids and antibiotics.
- Checking your urinary catheter.
- Checking your oxygen level.
- Reminding you to use the incentive spirometer to prevent pneumonia (10 times per hour while awake).
- Assessing the use of a back or neck brace.
- Checking compression devices to prevent blood clots.
- Assessing the appropriateness of blood clot prevention/administration of anticoagulants/early ambulation.



Write down any questions you may have for your doctor or nurse:

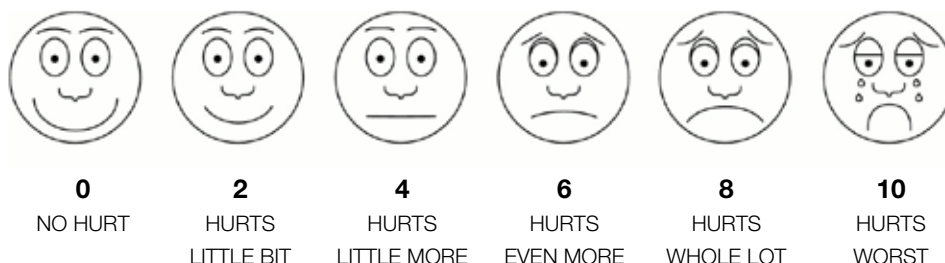
Your Hospital Stay

Drains

Following surgery, you may have one or more drains placed near the incision. A surgical drain is a thin, rubber tube inserted into your skin to drain fluid from around your incision. The drain may be held in place by a suture. The drain promotes healing and recovery, and reduces the chance of infection. The drain will be in place until the drainage slows enough for your body to reabsorb fluid on its own. The removal of the drain tubes will be determined by the amount of daily output and your surgeon's recommendation.

Pain Assessment and Management

Communication is an important part of helping us manage your pain. We encourage you to share information with your nurses and doctors about any pain you experience. Be as specific as possible.



Pain Control Following Surgery

Establishing progressive pain management strategies that speed recovery and minimize postoperative pain is a critical part of your recovery. Your surgeon and/or anesthesiologist will order pain medication appropriate for your individual needs. You may be given pain pills, pain shots, epidural pain management or patient-controlled analgesia (PCA). It is important to take pain medications when you first feel discomfort to make sure you are comfortable following the surgery. You should tell your nurse as soon as the pain begins, as it is easier to control before it becomes severe.

PCA involves a computerized pump that either delivers a prescribed amount of medication on demand when the patient pushes a button or delivers the medication in a continuous flow. The pump is programmed so that it will deliver only safe doses of pain medication.

Using pain medication enables you to perform the necessary activities to expedite your recovery and begin your exercise program. Our pain management specialists will work to transition you to oral pain medications as smoothly as possible.

We want all spine surgery patients to be as comfortable as possible to ensure that they can participate in recovery activities.

Spinal fusion patients may need to avoid anti-inflammatory medications, as these medications can slow the fusion healing process. **Absolutely no NSAIDs (nonsteroidal anti-inflammatory drugs) for three to six months following surgery or until cleared by your surgeon.**

It is important to tell your anesthesiologist about any past reactions to medications and inform your pain management team of any prescription medications you are currently taking for pain.

Your Hospital Stay

Clot Prevention

Your surgeon will employ appropriate strategies to reduce the risk of blood clots, called deep vein thrombosis (DVT), in the leg veins following surgery.

A mechanical device known as a calf pump may be used to squeeze the leg muscles and improve circulation while you are in the hospital.

Risk for DVT

DVT stands for deep vein thrombosis. DVT is a disorder in which a blood clot forms in the deeper blood vessels, particularly in the legs. Having spine surgery increases this risk as does being immobile or inactive.

Symptoms of DVT in the leg are swelling, redness and pain in the affected leg, usually below the knee. Sometimes the leg is warm to the touch.

Symptoms of a blood clot in the lung (pulmonary embolism) are shortness of breath, sudden onset of chest pain, cough and sometimes fainting. These symptoms require immediate medical attention.

Leg Swelling

Sitting with your legs down for prolonged periods of time can worsen the swelling of feet and legs for the first month following surgery. You should try not to stay in the same position for more than 45 minutes. You should alternate periods of walking with elevating your legs. Lying down and resting for an hour during the day should reduce swelling and promote healing.

Deep Breathing

Following surgery, you will need to take deep, slow breaths and exhale slowly to expand the small sacs in your lungs and help keep your lungs and air passages free of fluid accumulation.

To promote normal breathing patterns, you must sigh or yawn deeply several times each hour. Your normal breathing pattern can change and become more shallow following surgery, after general anesthesia, or when you are inactive or in pain. If this occurs, it is important to try to resume your normal breathing pattern by taking deep breaths. This deep-breathing exercise also stimulates the cough reflex to help you cough up secretions.

Upon your doctor's order, a respiratory therapist will see you following surgery to teach you how to use an incentive spirometer, a hand-held apparatus used to perform a deep-breathing exercise that promotes good lung expansion. Your nurse will remind and encourage you to perform these simple, yet very important breathing exercises.



Incentive Spirometer

Understanding Spine Surgery

Common Spine Procedures

Lumbar laminectomy and **laminotomy** are surgeries performed to relieve pressure on the spinal cord and/or spinal nerve roots by removing all or part of the lamina. The lamina is the roof of the spinal canal that forms a protective arch over the spinal cord. A laminotomy is the partial removal of the lamina. A laminectomy is the complete removal of the lamina. Patients can undergo laminectomies at several levels and still remain structurally stable. The spinal cord and nerves are protected by the bridge of bone on each side, along with overlying muscle and fascia, so the spinal cord is not exposed.

Lumbar microdiscectomy or **microdecompression** uses a special microscope or magnifying instrument to view the disc and nerves. The magnified view makes it possible for the surgeon to remove herniated disc material through a smaller incision, thus causing less damage to surrounding tissue.

Spinal fusion (arthrodesis) joins, or fuses, two or more vertebrae with a bone graft. The bone is used to form a bridge between adjacent vertebrae. This bone graft stimulates the growth of new bone. In some cases, metal implants are secured to the vertebrae to hold them together until new bone grows between them. In noninstrumented fusion, the surgeon does not use screws, cages or other hardware to help join the vertebrae together. Instead, the surgeon collects small pieces of bone from a bone bank, your pelvis or another part of your body. Next, the surgeon grafts these pieces between your vertebrae, which fuses the vertebrae together. Instrumented fusion refers to specifically designed implants (including cages, rods, and screws) that are used to ensure correct positioning between vertebrae to help successful fusion take place. These implants add strength and stability to the spine.

The two most common fusion techniques are posterior lumbar interbody fusion (PLIF), transforaminal lumbar interbody fusion (TLIF) and anterior lumbar interbody fusion (ALIF).

Posterior lumbar interbody fusion (PLIF)—With PLIF, the approach is from the back of the spine. After the approach, the lamina is removed (laminectomy). The facet joints may be trimmed, and the disc space is cleaned of the disc material. A lumbar interbody cage with bone graft is then inserted into the disc space. Additional implants may be used to further stabilize the spine.

Transforaminal lumbar interbody fusion (TLIF) is a surgical procedure done through the posterior (back) part of spine. The anterior (front) and posterior (back) columns of the spine are fused through a single posterior approach. Pedicle screws and rods are attached to the back of the vertebra, and a spacer is inserted into the disc space from one side of the spine. A bone graft is placed into the interbody space and alongside the back of the vertebra to be fused.

Spinal procedures may be open or minimally invasive (MI). A minimally invasive spinal procedure is any spinal surgery that specifically attempts to minimize tissue damage through the use of highly specialized tools and computer-assisted technology. The goal is the same as with the more invasive traditional procedures. You may or may not be a candidate for the minimally invasive option. Please discuss this further with your surgeon.

Your Hospital Stay

Anterior lumbar spinal fusion (ALIF)—With the ALIF option, an anterior or frontal approach is used. The surgeon makes an incision in the abdomen to access the spine and remove the damaged disk, which is replaced with an implant.

Cervical spine/neck surgery can be performed to relieve pressure on the spinal cord or to help stabilize the cervical spine. Fusion may be performed to add stability. Cervical fusion can be performed through the front of the neck (anterior) or through the back of the neck (posterior). Bone grafts may or may not be used in these procedures.

Anterior cervical discectomy and fusion is performed through the front of the neck. The surgeon removes the disc and inserts a bone graft into the evacuated space to prevent disc space collapse and promote growth of the two vertebrae into a single unit. This can be done for one or more levels.

Posterior cervical laminectomy and fusion is when the surgeon performs the procedure from the back of the neck to relieve pressure on the spinal cord. The objective of this procedure is to remove the lamina (and spinous process) to give the spinal cord more room. Sometimes fusion is necessary for stabilization.

Anterior cervical corpectomy is sometimes recommended when cervical disease encompasses more than just the disc space. The surgeon removes the vertebral body and disc to completely decompress the cervical canal. He or she then reconstructs this space employing an appropriate fusion technique.

Cervical laminoforaminotomy is a procedure that can be either minimally invasive or open. The surgeon creates a small “window” on one side of the spinous process and the junction of the lamina and facet joint, and then removes some bone and ligament to enlarge the area which the nerve passes out of.

Cervical laminoplasty involves a posterior approach. The surgeon accesses the cervical spine from the back of the neck and cuts through the lamina on one side and a groove on the other side, leaving a hinge that can open to relieve pressure on the spinal cord. The spinous process may be removed, and the bone flap is then propped open using small wedges or pieces of bone so the enlarged spinal canal can remain in place.

Artificial disc for cervical disc replacement involves inserting an artificial disc between two cervical vertebrae after the intervertebral disc has been removed to decompress the spinal cord or nerve root. The device preserves motion at the disc space. It is an alternative to having a bone graft, plates and screws used in a fusion, which eliminates motion at the operated disc space in the neck.

Your surgeon will explain your procedure options in greater detail.

Physical Therapy and Occupational Therapy for Spine Surgery

Physical therapy (PT) and occupational therapy (OT) following your spine surgery are critical components of your recovery.

The NorthShore Spine Center has a goal-oriented approach to care, which includes PT and OT specialists working closely with you to accomplish daily goals approved by your doctor. PT may begin as early as the day following your surgery and occurs daily until discharge or until you have reached your individualized therapy goals. OT also will assess you following surgery and provide treatment based on your need. PT will continue after you leave the hospital. You are encouraged to have a family member or caregiver attend at least one PT and one OT session to learn what to expect once you go home from the hospital.

NOTE: Please do not attempt to get out of bed on your own. Following spine surgery, there is a greater risk of falling.

Recovering in the Hospital

Day 0 (Day of Surgery)

Depending on the spinal surgery, you may be seen by a physical or occupational therapist. Your therapist will initiate spine precautions education, getting out of bed, transferring to a chair, going to the bathroom or other functional tasks based on your tolerance.

Day 1 (Day After Surgery)

- Most patients will begin working with a therapist the day after surgery. The therapist will evaluate you and formulate a plan of therapy. Depending on your progress, the therapist may see you twice a day (once in the morning and once in the afternoon).
- Be sure to ask for pain medication as it is no longer automatically given after the first 24 hours.
- Talk to your nurse about coordinating your pain medication schedule to receive it about 30 to 45 minutes before therapy sessions.
- The physical therapist will help you transfer from one position to the next, sit at the side of the bed, stand and walk a short distance. The therapist will also help with gait, balance and strengthening of lower and/or upper extremities.
- Depending on your progress, you may walk in the hallways and try going up and down stairs.

Your Hospital Stay

Day 2 (2nd Day After Surgery)

- The therapist will see you once or twice a day, depending on your progress and needs.
- Plan on walking more and continuing to work on balance, gait and general strengthening exercises.
- The therapist will have you walk the hallways and practice stairs.
- The therapist may offer you a walker or assistive device.
- The therapist will make sure you have all the equipment you need to be discharged.
- Patients recovering from spinal fusion may be in the hospital for five days or longer and will continue to see the physical therapist until discharge.

Occupational Therapy Schedule

Day 0 (Day of Surgery)

Depending on your surgery, you may see the occupational therapist the afternoon of surgery, but in most cases, the therapist will see you the day after your procedure. The occupational therapist will help you dress yourself, perform toilet transfer and safe car transfer technique, and understand the use of recommended adaptive devices.

Day 1 (Day After Surgery)

- The occupational therapist will see you sometime during the day to evaluate your needs.
- The therapist will show you assistive devices to help you with activities of daily living (ADLs) such as dressing and bathing.
- The occupational therapist may help you to the bathroom and assist you with bathing and grooming tasks.

Day 2 (2nd Day After Surgery)

- The occupational therapist will educate you on the proper way to get into/out of a car.
- The occupational therapist will address other functional concerns as applicable.
- If your hospital stay is for more than two days, the occupational therapist will continue to see you until you have reached your goals.
- The occupational therapist will make sure you understand all recommended bathroom and adaptive equipment prior to discharge.

Rehabilitation Following Spine Surgery

Your motivation and participation in physical therapy and occupational therapy are essential elements of your recovery. You must play an active role in every step of your rehabilitation.

Your rehabilitation team will include physical therapists, physical therapy assistants, occupational therapists and occupational therapy assistants. You and your team will work together to achieve important goals, including regaining independence and mobility, developing a program for walking at home, and understanding proper body mechanics and spine precautions.



Walking is the most important exercise following spine surgery.

Your therapist or nurse will help you sit up with your feet dangling over the side of the bed and stand. Each day, you will increase the amount of time and distance you spend walking. Some patients need a walker following surgery, and most are able to switch from a walker to a cane shortly after surgery.

Before you are discharged, you will be given a home exercise program.

Your dedication to physical therapy and occupational therapy will set the pace for your recovery.

Precautions Following Spine Surgery

Precautions begin immediately following your surgery and last through the duration of your recovery, typically about six weeks. Increase activity level gradually and rest as needed. Listen to your body and be mindful of your limits. Make sure to walk as much as you are able to tolerate. Gradually increase the distance and frequency of your walks.

Your surgeon may recommend a brace. If a brace is recommended, wear your brace as instructed by your healthcare professional.

The following precautions will ensure that you are maintaining good posture and using good body mechanics to help protect your back and neck.

Do's

DO keep your back straight and keep your nose and toes pointed in the same direction.

DO lift with your legs.

DO log roll to get out of bed.

DO keep your neck and back straight and in a neutral position while sleeping.

DO sit in a firm, supportive chair with arms.

DO lift items that weigh less than a gallon of milk.

DO carry items close to your abdomen.

DO change positions and move frequently.

Don'ts

Do NOT bend or twist with your back.

Do NOT lift with your back.

Do NOT twist or bend your back to get out of bed.

Do NOT allow your neck and back to be bent or twisted while sleeping.

Do NOT sit in a low, soft or unsupportive chair.

Do NOT lift items that weigh more than a gallon of milk.

Do NOT carry items with your arms extended and away from your body.

Do NOT sit for more than 30 minutes at a time.

Your Hospital Stay

Exercise Throughout Your Hospital Stay

Performing ankle pumps and quadricep sets in bed will help increase circulation and strengthen the legs. Try for 10 repetitions of each exercise every hour. You will likely experience some mild muscle aches or stiffness when you begin these exercises.

Ankle Pumps

Lie on your back with straight legs. Keeping your heels flat, pull your toes toward your head, flexing your feet, then point your toes away from you. Move your feet and ankles back and forth, completing a full range of motion.



Quadricep Sets

Lie on your back with one leg fully extended and the other leg bent, foot flat on the bed. Slowly tighten the thigh muscle of the extended leg and push the back of the knee into the bed. Keep your heel on the bed. Hold the muscle contraction for five seconds. After 10 repetitions, switch legs.



Your Hospital Stay

Proper Sleep Positions Following Spine Surgery



On your back, place a pillow under your head and another pillow under your knees.



On your side, place a pillow under your head and another pillow between your knees.

Proper Sitting Position Following Spine Surgery

Start sitting out of your bed for short periods as soon as you are able.

Do not sit for more than 30 to 45 minutes at a time.

Feet must be supported on the floor.

The spine should be supported on the back of the chair with a pillow.

Change positions throughout the day! Avoid spending prolonged periods of time in any one position.

Do not get out of bed without assistance!



Your Hospital Stay

Moving In and Out of Bed

Your nurse or physical/occupational therapist will review a “log rolling” technique to get in and out of bed.



Bend your knees.



Roll to one side.



Use your arms to push yourself up.

Your nurse or physical therapist will also help you with proper technique in sitting and standing and transferring to the tub/shower.

Walking

Walking is the primary exercise following spine surgery. Avoid hills, ramps and uneven surfaces.



Discharge Planning

Upon admission to the hospital, discharge planners will begin planning your discharge from the hospital. The majority of patients will not require home health care after discharge. Home health care or admission to a skilled nursing facility may be deemed necessary by your care team based on individual needs. If needed, discharge planners will confirm your home health agency or skilled nursing facility.

When all discharge criteria are met, your surgeon will discharge you. If you are being discharged to home, expect your home health agency to contact you.

Discharge Planning Process

The driving philosophy upon which the discharge planning process is built is that the best place for patients to be is in their own home. For this reason, the staff at NorthShore will work with you to ensure a successful transition to your home following surgery.

Remember, achievement of good outcomes and function is a partnership effort. Your role is to actively participate with the care team in rehabilitation, exercise and daily activity.

The care team at NorthShore begins preparing for your discharge home from the moment you walk through the doors. As such, your care team will be in constant communication with your surgeon regarding your daily progress.

Discharge Criteria

The following are general criteria used to assess the appropriateness of your discharge:

- You are medically healthy.
- All rehabilitation goals have been achieved.
- Arrangements have been confirmed with home health services.
- Initial home support is available from a family member/caregiver.

Ultimately, your surgeon will determine when you have met the criteria for discharge. Occasionally, however, adjustments to these plans may need to be made. If your plan of care does change, the discharge planners at NorthShore will be there to support your next transition.

If you are being discharged directly to home following your surgery, please remember that your surgeon has determined based on your presurgical status that you are safe to heal in the comfort of your home.

Remember that once you return home, your recovery may be supported through NorthShore University HealthSystem Home Care, or a home care agency of your choice, that has received specific care instructions for you from your surgeon. They will be there to support you as you begin your return to normal activity.

If you are not ready to be discharged home, please be prepared to provide the name of a preferred rehabilitation or skilled nursing facility where you can continue your rehabilitation until you are ready to go home.

Discharge Planning

Discharge Instructions for Spine Surgery

Medications

- Review the medication instruction sheet given to you by your nurse for your prescription medications.
- Take prescription pain medication as directed by your surgeon.
- Do not take anti-inflammatory medications (aspirin, ibuprofen, Aleve, Advil) until approved by your surgeon.

Diet

- Eat a well-balanced diet.
- A multivitamin capsule each morning for at least one month is advisable.
- Pain medication may cause constipation. We encourage you to drink lots of fluids and increase your intake of fruits and fiber.

Incision Care

Your surgeon will provide discharge instructions regarding care of your incision. You will receive instructions to keep a clean, dry dressing applied to the site or to leave the incision open to the air. If there is drainage, a small dressing with minimal breathable tape is okay.

If you notice **any** of the following symptoms of infection, please call the surgeon's office immediately:

- **There is drainage from the incision.**
- **The incision becomes red and very hot.**
- **You develop a fever over 100 degrees.**

Showering

Check with your surgeon regarding when you may take your first shower following surgery. Depending on how your incision is healing, this may be as long as four days following surgery. You may be asked to keep a Tegaderm dressing over the incision while showering until your sutures/staples are removed, or you may be allowed to get the incision wet. Your surgeon will provide you with specific instructions. If your incision gets wet, pat the incision dry—do not rub your incision or apply creams or lotions. If you are unsteady standing, you should use a stool or chair in the shower. **No swimming or baths until you are cleared by your surgeon.**

Discharge Planning

Ankle Swelling

You may get ankle swelling. If you lie down during the day and elevate your legs, the swelling should go away. If the swelling continues or if you have swelling in both legs, you should call your surgeon.

Blood Clots

The following symptoms may indicate the formation of a clot. If you notice any of these symptoms, please call your surgeon immediately:

- **Calf is painful and feels warm to the touch.**
- **Persistent swelling of the foot, ankle or calf that does not go away with elevation of the leg.**
- **Chest pain or shortness of breath (if this chest pain or shortness of breath is sudden or severe, call 9-1-1 and seek emergency care immediately).**
- **Rapid or irregular heart beat.**

Physical Activity

Walking is very important for the success of your spine surgery—but you must avoid the extremes of too little or too much.

- Do not sit for longer than 30 to 45 minutes at a time. Use chairs with arms. You may nap if you are tired, but do not stay in bed all day. Frequent, short walks—either indoors or outdoors—are the key to a successful recovery.
- You may experience discomfort in your spine, and you may have difficulty sleeping at night. This is part of the recovery process. Getting up and moving around alleviates some of the discomfort.
- You should do stairs with support. Do one step at a time. Use a railing if available.
- You may be a passenger in a car. Be careful to avoid excessive bending getting in and out of the car.
- You cannot drive before your four-week office visit after surgery. The decision to resume driving your car is made by the surgeon.

Following Surgery—At Home

Home Health

Once you are discharged, home health may be deemed necessary by your care team. This will be arranged if needed.

Home health nurses will visit several times per week. They will check and care for your incision, as well as make general assessments.

A referral will be made for a home physical or occupational therapist on an as-needed basis.

NOTE: Home health nursing and PT services must be provided by the same agency.

Discharge Home Follow-Up

Call your surgeon's office to arrange a wound check/suture/staple removal appointment 10 to 14 days after surgery and a follow-up appointment approximately four weeks after surgery.

Recovering at Home

Don't hesitate to contact your surgeon or nurse with questions about these instructions or your recovery in general.

Surgical Incision Care

You may apply a clean, dry dressing using breathable paper tape over the incision until your staples, sutures or steri-strips are removed. Sutures/staples are removed 10 to 14 days after surgery in your surgeon's office.

Following staple or suture removal, the incision should be left uncovered unless your surgeon tells you otherwise.

Contact your surgeon immediately if you see increased redness or draining around the wound.

Guidelines for Pain Medication

Only take pain medications as prescribed by your doctor.

Take medications before your pain becomes severe.

Do not drink alcohol if you are taking pain medication.

Notify your doctor if you are experiencing unpleasant side effects or if the medicine seems too weak.

Drink lots of fluids and increase your intake of fruits and fiber.

Following Surgery—At Home

General Complications of Spine Surgery

Deep Vein Thrombosis and Pulmonary Embolism (DVT/PE)

A DVT is a blood clot that forms in a vein, usually in the calf. This can occur following surgery because blood can pool (become stagnant) due to leg muscles contracting less vigorously and your body's clotting mechanism is hard at work to heal from surgery. A DVT presents most often with redness, warmth and swelling in the calf. This can sometimes also cause cramping in the calf muscle. A piece of the clot can break off and travel to the lung—causing a pulmonary embolism (PE). This requires immediate medical attention. Some common symptoms of a PE are shortness of breath and chest pain.

Prevention is the key. Getting up and walking soon after surgery is critical to prevent blood clots. Compression mechanical devices are used as well to help prevent pooling of blood in the legs. Medications called blood thinners are often used for higher risk patients.

Wound Healing Problems

This is rare but can occur any time an incision is made. Some patients also have risk factors such as: old age, multiple prior procedures, diabetes, alcoholism and poor nutrition, among others that increase their risk.

Infection

Developing an infection is a risk with any surgical procedure. We take every precaution to prevent infection, including administering IV antibiotics to our patients before and after surgery. Infections can be superficial or deep. Superficial infections present with pain, drainage, redness, odor, swelling and/or warmth around the incision area. These infections involve the skin and the layer of tissue just under the skin. They are normally treated with oral antibiotics and wound care. A deeper infection involves deeper tissue, sometimes surrounding tissue and/or bone, possibly the disc, typically at the level of the spine and instrumentation (if present). These infections are treated with IV antibiotics for longer periods of time and sometimes require surgical intervention.

Atelectasis/Pneumonia

Atelectasis occurs when the alveoli in the lungs collapse and gas exchange is compromised. Atelectasis can decrease oxygenation of one's blood and can increase the chance of developing pneumonia. Getting up, walking, and performing incentive spirometer (device that helps patients keep lungs inflated) deep breathing and coughing exercises are important to avoid developing atelectasis.

Ileus

An ileus is a condition that can occur following surgery when the movement in the intestines slows or sometimes stops. This temporary condition can lead to a partial or complete blockage in the intestinal tract. Common symptoms of an ileus include abdominal discomfort, bloating, and distension and inability to pass gas. Nausea and vomiting can occur, and appetite is typically absent along with the inability to have a bowel movement.

Treatment normally starts with increasing fluids, walking, and using suppositories and/or enemas to get the intestines "moving." Sometimes reduction of narcotic medication use is helpful, as narcotics are known to slow intestinal movement.

After Surgery—At Home

General Complications of Spine Surgery (continued)

Bleeding/Hematoma

Bleeding complications during or after spine surgery are rare but do occur. Following surgery, there is a chance that a blood vessel can begin to bleed. The body often can reabsorb this blood, but sometimes the blood can collect and expand like a “water balloon,” called a hematoma. The hematoma can put pressure on nerves and/or other structures and sometimes needs to be drained with aspiration. Occasionally, surgical intervention is necessary to remove the hematoma.

Position-Related Issues

After administering your anesthesia, your surgeon and physician assistant take great care in moving you and positioning you on the operating table. As you are asleep, every effort is made by the surgical team to properly pad any part of your body that could potentially incur discomfort and/or injury from constant pressure while lying still for a prolonged period of time. Despite this protocol, there are times when a muscle group can become bruised, a superficial nerve can become irritated (or even injured) or another pre-existing condition can become aggravated. Following surgery, most of these issues resolve quickly, but in some rare cases, some serious or long-lasting issues can occur.

Nerve Damage

Fortunately, serious neurological complications are very rare. However, there is a risk of injury to the spinal cord or nerves. Injury can occur from bumping or cutting the nerve tissue with a surgical instrument, from swelling around the nerve or from the formation of scar tissue. This can sometimes cause muscle weakness and a loss of sensation in an area supplied by the nerve.

Problems with the Graft or Hardware

Fusion surgery requires that bone be grafted onto the spinal column. The bone comes from the bone bank (from donors) or can be harvested from another area of the body. There is a risk of pain, infection or weakness in the area the graft is taken from.

After Surgery—At Home

General Complications of Spine Surgery (continued)

Cerebrospinal Fluid (CSF) Leakage

The spinal cord and nerves are contained in a sac that is filled with a clear, water-like fluid. Occasionally, the sac is opened during surgery. If the opening does not fully close, it may require repair, draining and a variable period of flat bed rest postoperatively for healing.

Nonunion

It is possible in fusion surgeries that the bones do not fuse as planned. This is called nonunion or pseudarthrosis, and the operation may need to be repeated.

In the second procedure, the surgeon usually adds more bone graft. Metal plates and screws may be added to rigidly secure the bones so they will fuse.

Ongoing Pain

Spinal fusion surgery is complex surgery. Not all patients experience complete pain relief with this procedure. Successful fusion occurs in more than 80% of surgeries. But a solid fusion does not guarantee freedom from pain. If your pain continues, talk to our surgeon about treatments for pain control.

Physical Therapy

If you are in pain while participating in physical therapy, take your pain medication at least 45 minutes before your therapy sessions.

Walking should be your primary exercise for recovery, gradually increase distance and frequency of walks as you are able.

Use long-handled assistive devices to minimize strain and prevent bending and twisting.

Your surgeon may prescribe outpatient physical therapy at your follow-up visit, if needed to help build strength, mobility and endurance.

After Surgery—At Home

Daily Activities

You may shower once your surgeon has cleared you to do so. You will be given instructions on care of your incision.

Minimize Postoperative Swelling

Swelling may occur following surgery. To minimize swelling, you can apply ice to the surgical site for 20-minute intervals.

Strenuous activity is to be avoided. Walk as tolerated.

Daily naps are recommended to help your body heal.

Continue the ankle-pump exercises described on page 26.

Limit sitting/standing to periods of 45 minutes to an hour.

Sexual Activity Following Spine Surgery

The vast majority of patients are able to resume safe and enjoyable intercourse following spine surgery. Since each patient recovers at a different rate, your surgeon will tell you when you have healed sufficiently to resume sexual activity.

The same precautions that apply to all activities—avoiding twisting or bending your back—also apply to sexual intercourse. Every safe position for sexual activity must maintain proper body alignment.

Additional information is available, including pamphlets with descriptions and diagrams of safe sexual positions. If you still have questions, feel free to ask your surgeon, nurse or physical therapist.

Write down any questions you may have for your doctor or nurse:

Inside Back Cover with pocket

BC Slits -- do not print white box
for position only

