Adult Spinal Deformity

The Baylor Scoliosis Center is dedicated to giving new hope to people dealing with the pain and disfigurement of scoliosis and spinal disorders – even those who previously thought their condition was untreatable.

BAYLOR
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Contents

Baylor Scoliosis Center

Perhaps you've lived with this condition all your life, or maybe you developed the signs and symptoms so gradually, you hardly noticed until the pain was almost debilitating. Whatever your situation may be, the Baylor Scoliosis Center delivers the advanced and innovative care you've waited for in a healing environment that nurtures much more than your physical well-being.

At the Baylor Scoliosis Center, we provide advanced medical care, along with in-depth information about your condition and your course of treatment. You'll also enjoy the restorative benefits of our home-like surroundings, tastefully decorated in warm tones and designed with your comfort and privacy in mind.

Only a handful of facilities in the nation are equipped to offer spinal reconstructive surgery and revision surgery, and the Baylor Scoliosis Center is proud to be among this elite group. These delicate operations, which involve surgically aligning the malformed and painful segments of the spine and fusing them in the correct positions, are both serious and complex. Typically, they offer a high success rate and may significantly improve the quality of life for the patient.

In the pages that follow, you'll find important information about the diagnostic and surgical procedures you'll be undergoing. This booklet of information contains information about your upcoming surgery. Please remember this is general information and all of the information may not apply to each condition. Preparation, education, and continuity of care are essential for a successful surgery. Please take some time before your appointment to fill in all applicable questionnaires, and to read over any special instructions you may need to follow prior to or immediately following your visit. At the Baylor Scoliosis Center, we're committed to delivering quality care to our patients.

Adult Spinal Deformity

Adult spinal deformity (ASD) includes spinal curves (scoliosis and kyphosis), and slipped vertebrae (spondylolisthesis). ASD also includes patients who previously had spine surgery, but are still having symptoms. People with ASD have many symptoms, but most common are back pain along the spine, in the buttocks and/or into the legs.

Scoliosis can be split into two different categories – adult idiopathic scoliosis and adult degenerative scoliosis.

Idiopathic scoliosis develops in adolescence, often causing no pain, and worsens in adulthood due to disc degeneration. Patients usually have uneven shoulders or a rib hump or their lower back might be more prominent on the side of the spinal curvature. Arthritis can also cause bone spurs, resulting in pain, stiffness, and sometimes numbness in the leg.

Degenerative scoliosis occurs when discs begin to break down and collapse and arthritis sets into the facet joints. Patients usually experience lower back pain, as well as pain, stiffness, numbness, and shooting pain down the legs.

This pain can vary from patient to patient but in some patients it is debilitating and can seriously impact function, self-image and overall quality of life. Patients with complex spinal deformities need specialized surgeons, as well as specialists in pain control and physical medicine to come up with a treatment plan that accounts for a patient's age, lifestyle and other factors.

What is a spinal deformity?

Scoliosis and kyphosis – what is the difference? Both involve an alteration in the shape and alignment of the spine that leads to a spinal deformity. Scoliosis is an abnormal sideward curvature of the spine and kyphosis is an abnormal forward curvature (hunch-back) of the spine.

Spondylolisthesis occurs when one vertebra slips forward in relation to the adjacent vertebrae. The condition can be a source of back pain, leg pain and other symptoms.

How do spinal deformities develop?

Many factors may contribute to the development of spinal deformity in adults. Curves tend to progress slowly (generally in the range of one or two degrees each year). Curve progression may be associated with disc degeneration and spinal arthritis. Pain may be related to nerve root compression from spinal stenosis or the degenerative spinal arthritis itself.

Non-surgical treatment for spinal deformity

In most cases, treatment for adult scoliosis begins with a combination of non-operative therapies that may be administered for weeks to months. These include:

1) Physical therapy to stabilize the spine; Pilates can be helpful in core strengthening
2) Anti-inflammatory medications and mild narcotics to relieve back pain
3) Epidural steroid injections to relieve leg pain.

Other conditions associated with spinal deformity

Compression of the nerves is caused by some of the following conditions:

1. **Degenerative disc disease:** Degenerative disc disease is the process of the disc aging and losing its ability to work as a cushion. During the aging process, or degeneration, the disc loses it elasticity, which can cause the disc to crack, flatten or eventually turn into bone. As the disc flattens, the bones (vertebrae) rub together which can cause bone spurs. These bone spurs can cause pressure / impingement on the nerves.

2. **Herniated disc:** The disc is the cushion between the vertebrae. The inside of the disc (known as the nucleus) is made up of mostly water. A disc herniation refers to the outer part of the disc (known as the annulus) tearing, thus allowing the soft watery material on the inside of the disc to come out of the disc. The disc herniation can then cause pressure on the spinal nerves and/or the spinal cord.

3. **Bulging disc:** A disc bulging refers to the soft inner part of the disc remaining in the annulus which is no longer in its proper place. The bulging disc can cause pressure on the nerves and/or the spinal cord.

4. **Spinal stenosis:** Spinal stenosis is where bone spurs narrow in the space through which the nerve roots and spinal cord exist in the spinal canal. This causes the nerve to be compressed or impinged, which is a source of leg pain.

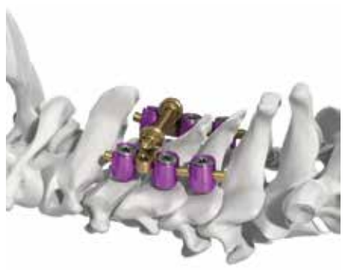
5. **Spondylosis:** This is degenerative arthritis of the spine.

Spinal Fusion Surgery

Your doctor has recommended surgery on your back to correct your spinal deformity. The surgery is called an anterior and/or posterior spinal fusion. Spinal fusion surgery usually takes four to eight hours, but the time varies according to the individual patient.

Anterior Lumbar Interbody Fusion (ALIF) is a type of spinal fusion that utilizes an anterior (front – through the abdominal region) approach to fuse (mend) the lumbar spine bones together. Interbody fusion means the intervertebral disc is removed and replaced with a bone (or metal) spacer; in this case using an anterior approach. The anterior technique is often favored when multiple spinal levels are being fused and multiple discs need to be removed. ALIF may be performed for the correction of spinal deformity. ALIF is also commonly performed for a variety of spinal conditions, such as spondylolisthesis and degenerative disc disease among others. ALIF is generally done on levels L3-S1. A general/vascular surgeon will be present to perform the anterior approach and assist during the procedure to maximize safety for all vascular structures.

Posterior Fusion with Spinal Instrumentation is the most common procedure for the correction of spinal deformity. An incision is made in the middle of the back. The muscles are moved to the side to expose the spine. The joints between the vertebrae are removed to loosen them up. If there is a severe deformity, a cut is made in the bone called an osteotomy, in order to realign the spine into a more normal orientation. The vertebrae are roughened up so that the body responds by producing new bone. The new bone eventually bridges the gaps between the vertebrae and makes them fuse together. Metal implants – rods, screws, hooks or wires (made of titanium and/or cobalt chromium) – are anchored to the vertebra in order to straighten and hold the spine still while the vertebrae fuse.



Risks and Complications

As with any surgery, there are a number of possible risks and complications associated with complex spine surgery. The rate of occurrence of potential risks and complications is highly variable. Individual patient risk factors, such as the condition of the disc, the patient's physical condition (bone strength, weight, diabetes, etc.), age, and whether or not the patient smokes, are among a few risk factors. The following list includes some of the common possible side effects for this surgery. Please note that the list includes some, but not all of the possible risks.

Bleeding: This is controlled by cauterizing bleeding vessels during the operation and by using a device that allows the return of blood lost back to the patient at the conclusion of the operation. If it is anticipated that a patient will lose a significant amount of blood, and there is a high likelihood for transfusion, the patient will be asked to donate two units of blood within a month before surgery.
Infection: This is a risk whenever the skin is cut for any operation. Before surgery, we have patients cleanse their skin with Hibiclens antiseptic soap and swab their nostrils with Bactroban antibiotic ointment. Sterile precautions are taken in the operating room and the patient is given antibiotics before the operation and for 24 hours after. In addition, the incision is washed with a pressurized system before it is closed.

Nerve Injury: The extent of possible nerve injury can range from a minor injury, such as numbness from compression of a nerve that supplies sensation to the front of the thigh, to a major injury, including paralysis. The risk of major neural injury is well under one percent, but it is not zero, so it is essential to have an open and honest dialogue with your orthopedic surgeon about this. The electrical activity of the nerves that transmit signals for sensation and muscle action through the spinal cord is monitored during the procedure. This gives feedback to the surgeon so that the necessary steps can be taken to remedy a problem if it occurs.

Dural Tear: Leakage of spinal fluid can occur due to a tear in the tissue (called the "dura") holding the spinal fluid and containing the nerves. This may require bed rest and, on rare occasions, surgical repair may be needed. This does not typically compromise the ultimate result.

Pseudoarthrosis: This is when the fusion doesn't take, or the vertebrae don't stick together completely. This may occur up to one percent of the time in children but more often in adults. It can take several months or a few years to become apparent. The patient may complain of persistent back pain, there may be progression of the scoliosis after the operation or the implants may fail. When the fusion doesn't take, motion over the long term will cause the metal implants to wear out and ultimately break. Treatment for pseudoarthrosis includes exploration of the spine, additional bone grafts and replacement of the implants.

Risks and Complications continued

Some additional common possible side effects for this surgery:

- Side effects from anesthesia
- Spinal cord injury with weakness, numbness, paraplegia, paraparesis, bowel and bladder dysfunction
- Non-union, delayed union, or hardware failure necessitating another operation
- Bleeding or a possible need for transfusion
- Major blood vessel injury
- The bone graft not healing properly, necessitating another operation
- A blood clot can form in your arms or legs (deep vein thrombosis) resulting in a pulmonary embolus
- ALIF-specific: ureteral injury and urinoma, impotence, bowel damage
- Blindness
- Death

Before Your Surgery

Before you have surgery you will be evaluated to make sure you are healthy enough for a complex surgery. For medical clearance you will need a chest x-ray, EKG and blood work. In some cases a cardiac stress test and or pulmonary function tests will be done. Surgical patients will have pre-operative spine procedures. These tests are completed pre-operatively (before surgery) and our care coordinators will help make your arrangements.

Some patients that are older or have chronic medical problems will require medical clearance before they are given a date for surgery. This is done to allow you to make changes in your medical treatment. For example, if your diabetes isn't well controlled you may need to adjust diet or medications prior to undergoing surgery. This process is to ensure that you're medically ready to undergo a major surgery.

A medical examination is required to determine whether you're healthy enough for surgery. Medical clearance prior to surgery is completed by an internal medicine physician along with a cardiologist, hematologist, or pulmonologist if necessary. Some patients will also receive a pain management consult for medication management before and after surgery. Please remember to bring your medication list to all appointments.

Cardiac clearance: You will be required to have cardiac clearance prior to surgery if you are currently under the care of a cardiologist, have a history of cardiac issues, or have risk factors for heart disease. You will be asked to provide the care coordinator with the name and telephone number of your cardiologist. This will allow us to obtain any cardiac studies such as an EKG, stress test or echocardiogram that have been done in the last year.

Blood work: You will have a standard blood workup and possibly some additional lab work depending on your medical and surgical history. A urine sample will also be taken to rule out a urinary tract infection. We will confirm the laboratory location and date with you.

Insurance: Our office will obtain surgical pre-authorization from your insurance company. You will usually receive a confirmation letter from them. Please be aware that the insurance company may authorize one or two days for a hospital stay. If additional days are needed, a case worker with the hospital will update your status and extend the authorization. They will also obtain authorization for your transfer to the rehab center if necessary.

Pre-operative Spine Procedures

Standing spine x-rays provide detail of the bone structures in the spine, and are used to rule out instability (such as spondylolisthesis), tumors, and fractures. Images of bones are made by directing an x-ray beam through the body. X-rays should not be performed on women who may be pregnant.

CT scans (computerized tomography) This specialized x-ray show the bony vertebrae in detail. The spinal canal can be imaged and assessed for specific conditions. With their excellent bony detail, CT scans are very useful for assessing fractures. Through multiple views, CT scans will image specific conditions such as lumbar disc herniation and lumbar spinal stenosis. CT scans should not be performed on pregnant women.

CT scans with myelogram provides important information about the spine and nerve roots. A myelogram requires introduction of radiographic contrast media (dye) into the sac (dura) surrounding the spinal cord and nerves.

MRI (magnetic resonance imaging) This non x-ray study allows an evaluation of the spinal cord and nerve roots. It produces detailed images of discs, the spinal cord, and other soft tissue, and is a great aid in assessing certain conditions. The scan is performed while the patient is lying in a fairly tight tunnel for 45-60 minutes. There is no radiation with the magnet, so the scans may be performed on pregnant women. However, it is not performed on patients with a pacemaker or metal in the body because of the magnetic field.

Discography, or discogram, is a diagnostic tool used to determine the structural integrity of a disc (or discs) and to find out if a particular disc is responsible for your back pain. A discogram is used to confirm a diagnosis not to treat back pain. A radiopaque dye is injected through a spinal needle into the center of the disc. The dye is then evaluated for leaks occurring outside the disc walls. At this time, the patient's symptoms (e.g., back pain, tingling sensation) may be experienced due to the pressure created by the dye injection.

Pre-surgical Schedule

Your schedule with dates and times will be sent to you by a care coordinator. The following may be required before surgery.

Two weeks before surgery: Blood work (see previous page for details).

One week before surgery: (To be done within 1-7 days prior to surgery depending on dates and needs). Pre-testing/pre-registration will be done at the hospital. During this appointment you will be pre-registered for surgery, and have a platelet test (to show how your blood clots) and a chest x-ray and an EKG if not done recently.

Five days prior to surgery: As with any surgery, infection is a serious concern. In order to help prevent infection the following are required:

Shower with Hibiclens antiseptic soap and place Bactroban antibiotic ointment in nostrils prior to surgery.

Beginning five days prior to surgery you will need to wash your neck, chest, abdomen, sides, and back with Hibiclens. Hibiclens is in a green bottle/box and can be purchased over the counter at most pharmacies or grocery stores. It is a strong antiseptic soap. You will need to use this daily up to your time of surgery. You may use a regular soap or body wash after using Hibiclens.

We will provide you with a prescription for a cream/ointment (Bactroban) and will require you to lightly swab each nostril twice daily, including the morning of surgery. If there is not a pharmacy number on file for you, one will be requested by our care coordinators. This ointment has been shown to decrease post-operative infections by sterilizing your nose against MRSA which is a very resistant organism.

Day prior to surgery: If your hospital pre-operative/pre-registration appointment is not the day prior to your surgery, you will need to visit the hospital for one last blood test. This is to determine your blood type and provide additional information for the blood bank. This test must be done by the hospital and must be the day prior to surgery.

Pre-operative Appointment: All patients are required to have a pre-op visit prior to surgery. At this visit, we will discuss the details of your surgery and any risks and complications along with post-operative care while you are in the hospital. The physician will answer any questions you may have regarding your surgery. Write down your questions so they can be addressed at this visit. We make every effort to be sure our patients understand their surgery and recovery time fully. You will meet with the care coordinator to discuss final details of arrival time, location and surgery times. At your pre-op visit you will be asked to sign permits for surgery, anesthesia, blood and blood products.
Someone must attend this visit with you. This could be a family member or someone very close to you that will be available during your surgery.

Brace fitting: If you are required to receive a brace you will either be fitted in our office during your pre-operative visit or a company called DJO will bring it to the hospital after your surgery. This will depend on the type of brace you need and your insurance requirements/benefits. In most cases, you will be fitted for and given your brace at your pre-operative office visit. You will need to bring this to the hospital with you.

Pre-surgical testing will include lab work, an EKG and and a chest x-ray.

Bone stimulator: If you are required to have a bone stimulator, this will either be given to you at one of your post-operative visits in our office or mailed to you by a company called DJO. It will not be given to you in the hospital. This is determined by your insurance company. If you do not have a bone stimulator by three weeks out of the hospital and have had a spinal fusion, please notify our office.

Pre-surgical Schedule

Smoking and Nicotine

Studies have demonstrated that the rate of non-fusion in smokers is as much as twice that found in non-smokers. It is thought that it is related to the negative effects nicotine has on bone growth (which is essential for achieving a spinal fusion). One of the most negative effects of nicotine is decreased revascularization of the bone graft. In essence, the bone graft does not get enough nutrients due to a lack of blood supply and, therefore, does not grow and cannot form a fusion. Another recently discovered effect of nicotine is that it may have anti-inflammatory effects, which also interfere with fusion healing.

Because of this, we require that patients undergoing a spinal fusion be nicotine-free prior to receiving a surgical date. Once you are 100% nicotine-free for two weeks a nicotine test will be given. This test will show the nicotine (current in your system) and cotinine. The cotinine is what is stored in your fat cells. This will take about 6 weeks to show negative but this level is not of concern on the first test. We will do another nicotine test with preoperative blood work. Your nicotine should still be negative. If your cotinine is higher than the previous test that will tell us that you did smoke at some point and this could lead to your surgery being postponed or temporarily cancelled.

Nicotine Products to Stop/Avoid

- Cigarettes
- Nicotine gum
- Nicotine patches
- Electronic cigarettes
- Cigars
- Dip, chew, snuff, etc.

Medications to Stop Prior to Surgery

It is important to avoid certain medications prior to surgery. The following medications can have effects on bleeding and swelling, increase the risk of blood clots, and cause other problems if taken. Medications may have been prescribed to you by one or more of your physicians to treat the condition for which you are having surgery, or perhaps they may have been prescribed to treat another condition unrelated to your surgical diagnosis. In either case, if they are listed below they must be discontinued at the appropriate time prior to surgery or there is the risk your surgery will be canceled/rescheduled for your safety.

Please note that there are many over-the-counter medications, herbals, vitamins and supplements that affect your surgery and recovery negatively.

It is crucial that you provide us with an accurate list of all medications you currently take when you schedule your surgery. Also, if there are any changes in medications from the time you schedule surgery to your date of surgery please notify us so we can update your medication list.

If you are taking Coumadin (warfarin), aspirin, or anti-platelet medication for heart or blood clotting conditions, please discuss with our office prior to discontinuing. We may need to speak with your physician so we can determine how they should be managed before and after surgery.

Remember to check the labels of all your medications, even those you purchase over the counter, to be sure you are not taking any aspirin or anti-inflammatory drugs. Tylenol does not promote bleeding and is generally fine to take in place of aspirin or other anti-inflammatory medications before surgery. If you are unsure about any medication, please contact our office. We will review the medication in question and advise you whether to discontinue.

Guidelines for Stopping Medications

Medication Type	Discontinue	May Resume
Herbs and Supplements	3 Months Prior	2 Weeks After
Hormones, Birth Control	2 Weeks Prior	3 Months After
NSAIDs / Anti-Inflammatory	6 Weeks Prior	6 Months After
Prescriptions with Blood Thinners	6 Weeks Prior	Up to 1 Month After
OTC with Blood Thinners	6 Weeks Prior	Up to 6 Months After
Bone Density Medications	1 Month Prior	Up to 6 Months After
MAOI	2 Weeks Prior	

Medications to Stop Prior to Surgery

Below is a list of medications in each category to discontinue. Please note that there are many prescribed and over-the-counter medications and supplements that can be a contraindication to your surgery and recovery. We have compiled a sample list.

You must stop all herbals or dietary supplements for at least three months prior to surgery date. Below are some examples of herbals and supplements, but this is not a complete list. NOTE: Vitamin D, B vitamins, iron and calcium do NOT need to be discontinued. As previously stated, if there is a medication in question, please contact us to review it.

Medications to Stop by Category

Medication Type	
Herbs and Supplements	Alfalfa, Bilberry, Bromelain, Cayenne, Danshen, Dong Quai, Echinacea, Ephedra, Ephedrine, Feverfew, Fish Oil, Garlic, Ginger, Ginkgo, Ginseng, Goldenseal, Hawthorn, Kava Kava, Krill Oil, Licorice, Ma Huang, Omega-3 Fatty Acids, Red Clover, Saw Palmetto, St. Johns Wort, Vitamin E, Valerian, Yohimbe **Includes Daily Multivitamins**
Hormones (HRT)	Activella, Aygestin, Estrogen, Estradiol, Levonorgestrel, Mirena, Micronor, Nor Q, Premphase, Prempro, Prometrium, Provera, Birth Control Pills/Patches/Shots
NSAIDs/ Anti-inflammatory	Celecoxib/Celebrex, Diclofenac/Voltaren, Ibuprofen/Motrin, Etodolac/Lodine, Ketoralac/Toradol, Indomethacin/Indocin, Naproxen/Aleve & Naprosyn, Mobic, Oxaprozin/Daypro, Vicoprofen, Piroxicam/Feldene
Prescribed Medications with Blood Thinning Agent	**Stop Any/All Blood Thinning Medications** Aggrenox, Aspirin, Carisoprodol w/ ASA, Coumadin, Endodan, Fiorinal, Effient, Prasugrel Magan, Plavix, Pletal, Percodan, Persantine, Soma, Compound, Xarelto, Rivaroxaban, Ticlid
Over-the-Counter (OTC) with Blood Thinning Agent	Alka Seltzer, Anacin, Ascriptin, BC Powder, Bayer, Doan's, Dristan, Ecotrin, Excedrin, Kaopectate, Midol, Pamprin, Pepto Bismol, Sine-Off, St. Josephs, Vanquish (Check the labels of all your medications, even those you purchase over-the-counter, to be sure you are not taking any **aspirin or anti-inflammatory drugs.**)
Bone Density Medications	Actonel, Boniva, Fosamax, Evista, Miacalcin *May continue Forteo
Monoamine Oxidase Inhibitors	Isocarboxazid (Marplan), Phenelzine (Nardil), Pirlindole (Pyrazidol), Moclobemide (Aurorix, Manerix), Selegiline [L-Deprenyl] (Eldepryl, Zelapar, Emsam), Tranylcypromine (Parnate)
Miscellaneous	Allopurinol (6 weeks)
Anti-Rheumatics	**Stop 2 Weeks Prior to Surgery, Resume 3 Months Post-Op** Enbrel, Arava, Remicade

On the Day of Surgery

On the day of your surgery you will be asked to arrive approximately two hours before it is scheduled. You will check in on the second floor of Baylor Regional Medical Center at Plano and be escorted to a room in day surgery. While in day surgery you will be prepared for your surgery. The nurses will place an IV in your arm for surgery. You will meet the anesthesiologist and your surgeon.

The scheduled time of your surgery is an approximation. We will do our best to keep you informed of any changes.

During your surgery, an operating room nurse will call your family periodically to update them on your surgery. After surgery, the physician will meet with your family in the waiting room on the second floor and let them know how surgery went.

Planning for Hospital Discharge

Recovery from surgery varies among patients and is dependent on the extent of the surgery as well as the age and health of the individual. After surgery you will either be discharged home or to an inpatient rehabilitation center. The need for inpatient rehab differs depending on age, type of surgery and progress in hospital after surgery. Pre-operatively we verify that you have benefits for inpatient rehabilitation. But it is not until after you are out of the intensive care unit that your insurance company/Medicare evaluates your progress and approves you to go to rehab or deems you able to go home. There are many variables involved in the insurance approval process. Inpatient rehab is not guaranteed for any patient, so you need to make arrangements for home care after surgery.

Since it is difficult to predict your post-operative course before surgery, we suggest you make plans for both home and inpatient rehab hospital.

During your hospital stay, plans for your discharge will be completed by your nurse practitioner with the assistance of the social worker and care coordinators. They will help with insurance and appropriate referrals to inpatient rehab or help you arrange for home health care nurse, physical and occupational therapy and any assistive devices you may need.

Discharge Home

A large percentage of patients go directly home following their hospitalization. The best time to plan for this is prior to surgery not after. Arrange for transportation home from the hospital. Arrange for help at home by asking dependable family and/or friends. You will need someone to stay with you for one to three days once you are home. Depending on how you're doing you may be able to be left at home for short periods if family has to work, but you will need assistance at home for a couple of weeks. You will not be able to drive or do strenuous activity for a few weeks and will need assistance with meals, errands and household chores. Also, if you have small children at home you will not be able to care for them alone for at least one to two weeks after discharge since you will not be able to lift them.

Discharge to Inpatient Rehabilitation

If you have your surgery at Baylor Plano you will be discharged to Baylor Institute for Rehabilitation (BIR) for rehabilitation. They have locations in Dallas and Frisco. We prefer that you go to one of these locations because their team is familiar with post-operative spinal deformity patients and their special needs. See the next page for general information of what to expect and pack for your stay.

Plan to be off work for eight to twelve weeks. You will then be released to return to light duty part-time, generally after your first post-operative visit. You can increase your length of day gradually week by week. This is due to the nature of surgery, medications, and fatigue. Should your employer feel you are capable and ready to go back sooner or need your off time extended, this can be discussed at your post-op visit.

Plan for family to stay with you if you are from out of town. We understand it is important for your loved ones to be present during the time of your surgery, hospitalization and recovery. However, they need to be prepared to take care of themselves medically and financially for up to one month. This is also dependent on if there are surgery complications or if you qualify to go to rehab. This includes planning for hotel/housing, transportation to and from hospital, medications and meals. The hospital does not provide meals to family, but there is a café in the hospital. While the hospital does have a pull-out sofa in each regular hospital room there is no in-hospital arrangement for sleeping while you are in ICU. We can give you an approximation of how long you may be in ICU but realize that this is not guaranteed since we cannot foresee any complication after surgery. There are a number of hotels and restaurants within walking distance to the hospital and we would be glad to provide a list. Neither the hospital nor our office can be responsible for your loved ones.

After Your Surgery

Following your spine surgery, the nursing staff will monitor you in the intensive care unit. After waking from the anesthesia you will be asked to do an assessment of movement and sensation in your legs. You will feel groggy, thirsty, and/or cold. This is normal after surgery and anesthesia. Your throat may also be sore from the breathing tube placed in surgery. You will also have:

- A monitor for your heart, blood pressure and breathing.
- An IV-type catheter in your wrist to monitor your blood pressure.
- An IV in your neck to give you fluids and medication.
- A catheter (tube) to drain your bladder.
- Boots or special stockings on your legs to help prevent blood clots.

Pain Management

Patient controlled analgesia (PCA) is used post-operatively for pain control. This device allows a patient to self-dose pain-relieving medication at the push of a button. You will be transitioned to pain medication and off the IV over the course of your hospital stay. Our goal is to keep you as comfortable as possible. However, having no pain after major spine surgery is not likely. This is a very painful operation. Every movement that you make will be transmitted into the muscles in your back. Patients have used words such as "I feel as though I've been beaten up in the back with a bat". Fortunately, this pain will eventually subside. The sharp pain typically lasts for two to four weeks. The pain will gradually begin to decrease, but you will still have some discomfort for a couple of months after surgery. How quickly the pain subsides is dependent upon how fast the bone heals.

Constriction and squeezing stiffness in your back is from muscle spasms. Moving is the best way to alleviate this. Lying in bed only makes the spasms longer and more severe.

Some patients may have leg pain after the surgery because the nerve was pulled aside or stretched. These symptoms also should gradually improve.

You will have a drain coming from the incision. The drain removes the extra fluid from the layers of tissue under your skin. This helps to reduce the swelling in your neck and allows the physicians and the nurses to monitor the amount of blood you have lost. The tube will be removed in a couple of days.

After the operation, you will be given ice chips and clear liquids. When normal bowel function returns, you will be able to eat a regular diet. This usually occurs within one to two days.

A physical therapist will assist you with walking after surgery. On the first day, the goal is to get out of bed to a chair. On the second day, the goal is to walk out of the room. By the third day, you may walk as tolerated. The physical therapist will teach you techniques on how to turn, get in and out of bed and walk independently in halls. Occupational therapists will help you with activities of daily living (feeding, bathing, grooming yourself and functioning independently).

Bed rest is not good for you. The sooner you get up, mobilize, walk and resume normal activities the lower the chance of developing a blood clot in your legs. The symptoms of a blood clot are swelling, redness and pain in your calves. If you develop these symptoms, please let us know right away.

You will be observed in the intensive care unit for one to two days before being transferred to the floor. Don't expect to sleep too much while in the hospital after your operation. The surgery, anesthesia and pain medications allow you to have a several-hour nap during the day, which may disturb your wake/sleep cycle. You may only be able to sleep two to three hours the night after your surgery.

You will have an x-ray of your new spine before you leave the hospital and you will have x-rays taken in the office at six weeks post-operatively to assess the fusion.

When Can I Leave the Hospital – Discharge

Once your drains are out, your medical condition is stable, and your pain is under control with pain medication you will be discharged.

Most patients are able to leave the hospital after four to six days. Recovery from spinal surgery varies greatly among patients and is dependent on the extent of the surgery as well as the age and health of the individual. You will be able to ride in a car or plane upon leaving the hospital.

In order to be eligible for acute rehab, you must be able to tolerate three hours of therapy a day and have a skilled need for two of the following therapies: physical, occupational, or speech. This evaluation will be done during your hospital stay. Some patients need to approach therapy at a slower pace and will best be served at a skilled nursing facility (SNF). You have the option of choosing an SNF near your home or staying in the Plano area.

Surgery Discharge Instructions

Pain

Everyone experiences some degree of pain and muscle spasm after spinal reconstruction surgery. We will do our best to make sure that you are as comfortable as possible during your hospitalization and your recovery at home. The goal of using pain medication, as part of your treatment plan, is to reduce pain in order to improve your ability to participate in activities and function. Not moving will make your spasms and pain worse.

Prior to release from the hospital, you will be transitioned to oral pain medications. You will be given prescriptions for medications prior to going home.

It is not unusual for patients to have three weeks of considerable pain before they notice some improvement. It may be up to six weeks before patients are feeling as though they have crossed a pain "threshold" and are comfortable with activities of normal daily living such as showering, using the restroom and sitting for meals.

Eventually you will wean from narcotic pain medication to Tylenol. When this occurs, you may take two extra-strength Tylenol in place of your narcotic pain medication up to four times per day.

*If the patient has a pain management physician prior to surgery, the patient continues to follow up with the physician after surgery. We will give pain medications upon discharge and the patient should schedule an appointment with his or her pain physician when the patient gets home.

Helpful Hints for Pain

- **Ice:** Applying an ice pack to numb the painful area will help in easing pain and discomfort. Do not leave ice on longer than twenty minutes per hour. A bag of frozen peas wrapped in a kitchen towel makes an ideal ice pack. Mark the bag of peas and return them to the freezer (to be used as an ice pack later).
- Change your position every forty-five minutes during the day.
- Avoid prolonged sitting.
- Take your pain medicine at least thirty minutes before physical therapy.
- Take pain medication before pain gets out of control or it will be less effective.

Medications

You will be sent home with pain medication, muscle relaxants and/or anticonvulsants. These are different types of medications that can be prescribed to help control your pain.

Narcotics

The main treatment goal of narcotics is to reduce pain and improve a person's ability to function and/or work. Narcotics prescribed after surgery can be short acting (Norco or Hydrocodone, Percocet or Dilaudid) or longer acting if needed as determined by your physician (MS Contin or OxyContin). Norco or Percocet is what you will be prescribed first for pain. This will be taken every four to six hours for the first couple of days at home. If you were prescribed Dilaudid, it is for additional pain not relieved by Norco or Percocet. Dilaudid should be used for breakthrough pain only and is only prescribed for the first month after surgery.

You should gradually reduce the amount of pain medication you take. Begin by increasing the amount of time between pills, and then reduce the number of pills taken each time. A certain amount of discomfort can be expected until the inflammation and swelling goes down and nerve sensitivity decreases. Most patients are off almost all pains medications by twelve weeks.

Side effects of narcotics include constipation (see section on constipation), drowsiness, itchiness, nausea and vomiting. The use of narcotics can impair your judgment. While on narcotics, you should not make important decisions, operate heavy machinery or do work at elevated heights.

Muscle Relaxants

Muscle retraction and dissection is a necessary step in your surgery; therefore post-operative muscle spasms can be quite severe and painful. Muscle spasms can be managed by a combination of muscle relaxants, rest and stretching. Muscle relaxers are scheduled to be taken every eight hours. DO NOT stop muscle relaxants unless directed to do so as this will increase your pain. Examples of muscle relaxants are metaxalone (Skelaxin), methocarbamol (Robaxin), carisoprodol (Soma), cyclobenzaprine (Flexeril), and tizanidine (Zanaflex).

Side effects of muscle relaxants include flushing, dizziness, drowsiness, metallic taste, nausea and vomiting.

When you were discharged from the hospital you may have been given valium for muscle spasms. This is to supplement not replace scheduled muscle relaxants (Robaxin). Valium is to be used sparingly when muscle spasms are not relieved by rest or narcotics. We do not refill prescriptions for valium; it is just for the first month after surgery.

Medications

Nerve stabilizing medications

Some patients may have leg pain after the surgery because nerves are pulled out of the way during surgery. These symptoms should gradually improve with time. Neurontin/Gabapentin and Lyrica/Pregabalin are in a class of medications that work by decreasing the number of pain signals that are sent out by damaged nerves in the body. They relieve neuropathic pain (pain from damaged nerves) that can occur in your arms, hands, fingers, legs, feet, or toes.

Side effects include drowsiness, tiredness or weakness, dizziness, headache, shaking of a part of your body that you cannot control, or swelling in extremities.

Miscellaneous medications

Do not take NSAIDs for at least six months after all fusion surgeries. These include Motrin, ibuprofen, Advil, Aleve, Naprosyn, Mobic, Daypro and any medications that contain these.

Females may restart hormones/oral contraceptives one month after surgery.

You can start taking calcium, vitamin D, vitamin E and any multivitamins when you get home.

Do not take any herbal remedies until your first post-operative visit and it is agreed to by your surgeon. Medications for sleep, depression, anxiety, hypertension, cholesterol, etc. need to be prescribed by your primary care physician. These medications may be resumed after surgery.

Constipation

Constipation is a common problem for patients who have recently undergone spine surgery. Both narcotic pain medication and iron pills can cause constipation which can be a major source of pain and discomfort. The goal is to have a bowel movement (BM) at least every other day. The following interventions will help relieve constipation.

- **Do not go** longer than three days without a BM – start laxatives.
- Prune juice, apple cider, and/or foods high in fiber make it easier to have a BM. Good examples are high fiber cereals, beans, vegetables, and whole grain breads.
- Drink plenty of fluids and try to get up and walk several times a day.
- Take stool softeners (docusate), one to two tablets twice daily only.
- If these things don't help, then over-the-counter laxatives Senokot or Dulcolax (stimulant laxative) are recommended. Start with two tablets at bedtime and increase as needed. Do not take more than eight tablets per day.
- If constipation still persists, you may need to use a Fleet enema. If a regular Fleet enema is not effective, try an oil-based Fleet enema.

Incision Care

You may remove your dressing the day you go home. You do not need to keep your incision covered with a dressing, but keep a clean T-shirt or other clean article of clothing over it, and change a minimum of once a day.

Check your incision at least daily for the first three weeks for any sign of infection. These signs include increased warmth or redness in the area, swelling, discharge, or unexplained increasing pain in the incision not relieved by bed rest or local application of ice (see instructions for ice in activity section).

You may shower and wash your wound with mild non-fragrant soap (Dial antibacterial, Ivory, etc.) and water and pat dry.

Do not apply cream/ointments to the incision for at least eight weeks.

You will have Steri-Strips (adhesive skin closures) over your incision. These should stay on for twelve to fourteen days following the surgery. You may shower with these on. Remember to gently dry the incision area/Steri-Strips. It is common for the edges of the strips to loosen and curl. Simply clip the frayed edges but leave the strips on for fourteen days unless they are so loose they are obviously no longer functional. In this case, you may gently lift off the strips, but do not pull or jerk to remove them.

Do not soak in a bath tub or hot tub or swim until you have seen the surgeon or physician assistant for your follow-up visit. We suggest avoiding immersion in water for three to four weeks post-op, and then only if your incision is healed to prevent infection.

If you have staples in your skin, they will need to be removed fourteen days from the date of surgery. You will need an appointment to have this done.

You may experience some numbness and tingling around your incision and your incision may seem very sensitive. This is normal after surgery and will resolve in time.

DO NOT use a heating pad on your back or incisions for any reason because you will have decreased feeling of the skin and incision area and may burn the skin.

Avoid exposure to direct sunlight on your incision for at least one year to avoid spreading of the incision and to maintain good cosmetic closure of the wound. If you do go out into direct sunlight use at least 30 SPF sunblock.

Brace and Bone Stimulator

Depending on the type of spine fusion there may be a brace used after surgery. The brace helps with comfort and decreasing muscle strain. It also reminds patients of posture and new spine position.

For the first eight to twelve weeks wear your brace when you are up for extended periods of time, leaving the house and/or riding in a car. When you are in bed, in a reclining chair, getting up to go to bathroom or around the house you do not need to wear your brace. The brace is to provide support for you and also to remind you not to bend at the waist. Wear your brace for physical therapy. If at any time you feel the brace is putting you in an uncomfortable position or not fitting properly, contact our office.

Your surgeon may recommend a bone stimulator during your post-operative recovery phase to help assist with the bone fusion process. This will be given to you at your first post-operative follow-up visit or mailed to you by the company with instruction for use. You do not need this if you are going to inpatient rehab.

When to Call Office

Call our office if you have:

- Drainage and/or odor coming from your wound.
- Increased redness/swelling at the incision site, or unexplained increasing incision pain not relieved by bed rest or ice.
- Fever greater than 101 degrees with/without sweats or chills.
- Unfamiliar pain or weakness in the arms or legs.
- Difficulty with urination or bowel movements, pain or numbness in the rectal, vaginal or scrotal area.

Activity

At first, you will limit yourself due to stiffness and soreness. After the first several weeks, however, you will become more active and gradually return to your normal activities. Fatigue is common. Let pain be your guide.

Begin walking in the house and progress to outdoors. Increase the time and distance daily. If you feel soreness, reduce the distance and rest. These are guidelines, not rules. You are encouraged to walk as much as possible without restriction. We like to have patients walking with a goal of three or four times per week for at least 20 to 30 minutes at a time during the first few weeks home. Your goal in the first few weeks is to regain basic movements.

Riding as a passenger in a car or taking public transportation is all right. Climbing stairs when you go home is okay. Avoid sitting for long periods of time.

Do not lift anything heavier than 10 pounds. No lifting objects above shoulder level. Also refrain from twisting, bending, pushing, stooping and straining for the first four weeks. This may increase pain and muscle spasms.

There are techniques that are taught to patients while recovering in the hospital to compensate for these restrictions. There are special devices given to you in the hospital that will help in reaching and lifting. Housework and yardwork are not permitted until the first follow-up office visit. This includes gardening, mowing, vacuuming, ironing, and loading/unloading the dishwasher, washer, or dryer. Refrain from high-impact activities such as running, horseback riding, or any radical side-to-side motions until cleared by your surgeon.

Physical Therapy

We usually recommend physical therapy at a later time when your body and muscles have healed from surgery. The first month home is to get used to being home and your daily activities. We will release you for physical therapy when you are ready. This may be at your first or second postoperative visit depending on your progress. Physical therapy typically begins three to four months after surgery, and usually lasts six to twelve weeks. Initially, stretching exercises are performed to provide maximum flexibility.

Spinal deformity causes an imbalance in the muscles supporting the spine; this imbalance will make those muscles weak. After surgery these weakened muscles will be inflamed, causing frequent muscle spasms.

Physical therapy will to help strengthen, coordinate and balance the muscles around the spine that are weakened and painful. However, when you start to increase activity especially physical therapy, those weak muscles will fatigue easily causing increased back pain. For this reason do not stop taking muscle relaxers even if you think they are not helping. Do not be discouraged if you have flare-ups in your symptoms on occasion. This is normal. Flare-ups are bound to occur during this phase because your body has not fully healed.

Physical therapists will be able to show you activities that help maintain good posture and don't twist the spine. Other activities that are recommended after three months post-operative are yoga, Pilates, core strengthening, strength training, and walking. Expect to continue a core strengthening program for life as it will keep your muscles strong to support your spine.

As your fusion becomes stronger you can increase activities and strength training. Eventually by six months you can participate in low-impact activities. Swimming or cycling are the best workouts because they will not jar the spine.

Out of Town Patients

Once you are discharged from the hospital, if you don't go to a rehab hospital, you will need to stay in the area for up to one week. You need to include this in your pre-operative plan. We want to make sure that you are functioning and doing well outside of the hospital before we allow you to travel home. We can arrange daily physical therapy at Baylor Regional Medical Center at Plano during this time. When you are released to return home make sure you have pain medications for the trip and take frequent breaks to walk around and stretch.

Depending on how well you are doing the first two to four weeks after surgery you will be required to come back and see the surgeon. This will take place anywhere from one to three months after your surgery.

Since you are not located near our practice, when you return home you will want to notify your primary care physician. If you have staples they can be removed by your primary care physician or home health nurse ten to fourteen days after the date of surgery. If you have problems when home we may refer you to see your PCP so you don't have to travel back to Plano to be seen. Periodically you will be asked to have films completed in your hometown and sent to the office for review.

Miscellaneous Items

Smoking: Smoking/nicotine impairs wound healing and the spinal fusion process. Stopping smoking will improve your overall outcome. This also includes dip, chewing tobacco, nicotine patches and gum, since these contain nicotine. If you need medications to help you quit, please consult with your primary care physician.

Prophylactic antibiotic: You will need to be pre-treated with antibiotics prior to any dental procedures and routine hygiene appointments for the next three years. Your mouth is very vascular and this is done in an effort to prevent bacteria from entering your bloodstream which could cause an infection around your hardware. Amoxicillin 2000 mg should be taken by mouth one hour before your dental procedure. Please contact your dentist or family physician for a prescription prior to these invasive procedures.

Sexual activity: Postpone sexual activity until your follow-up appointment unless your surgeon specifies otherwise. As your back heals, you may feel ready to have sex. This is usually fine. Choose a position that puts as little pressure on your back as possible. Side positions or lying on your back are generally acceptable. Avoid putting pressure on your back or arching your back during sex.

Driving: You are not going to be able to drive a car until you are off narcotic pain medications, which can impair judgment and lead to increased risks for yourself and others. This may take six to eight weeks for patients undergoing spinal reconstruction surgery. Travelling by car is allowed for short distances. If you are making longer trips, break the trips up into 30-40 minute segments, getting out of the car to go for a short walk.

Filter removal: Some high-risk patients may have a clot filter placed after surgery. This filter may be removed after 30 days. The care coordinators will assist you in making appointments to get this done.

Metal detectors: Most spinal instrumentation is made of titanium. This metal is not usually detected by commercial metal detectors such as those in airports.

Emotions: It is normal to feel discouraged and tired for weeks after your surgery. These feelings may be your body's natural reaction to the stress of surgery. Although emotional letdown is not uncommon, it must not be allowed to get in the way of the positive attitude essential to your recovery.

Insomnia: You may have difficulty sleeping. This is normal. Don't sleep or nap too much during the day. You may try an over-the-counter sleep aid (Benadryl, Unisom etc.), if you wish. Eventually you will return to your normal sleep pattern.

Fatigue: Your energy level will be decreased for the first month. Most patients feel fatigued, sometimes to the point of exhaustion for up to four months after surgery. This is usually due to deconditioning, and, in some cases, due to anemia and some situational depression. These symptoms usually resolve.

General Outline of Goals and Tips for Your Stay at the Rehab Facility

Rehabilitation is designed to strengthen a patient physically. It is also provided to educate patients on back safety and precautions until they are ready to come out of the back brace.

- On admission patients are evaluated for any medical problems and orders are written to include internal medicine consult, wound care management team, and any therapies that are needed specific to the patient.
- Assessments are made by all disciplines and a daily therapy schedule is made for each patient.
- Each patient will participate in three hours of therapy a day.
- The medical team and the patient and family will have a conference to determine the estimated length of stay based on clinical assessments. If needed these are done on a weekly basis.
- On discharge patients will leave the rehab facility and go directly to the scoliosis center for a follow-up appointment. Patients will need a family member or friend to pick them up and take them to this appointment. They are given prescriptions for medications for thirty days.
- Any additional therapies at discharge will be determined by your physician at your first or second post-operative office visit. The rehab team will give you a home exercise program to follow.

Personal Item Needs

- Sneakers and socks. You will need a pair of shoes that will fit and stay on your feet during walking and therapy.
- T-shirts to wear under your brace (if applicable). This helps to keep the brace clean and reduce rubbing or skin irritation.
- Toothbrush, toothpaste and hair brush.
- It is recommended that you bring pants or shorts with loose elastic or drawstring that are easy to get on. Your stomach will be bloated/swollen after surgery and you don't want tight pants to irritate your incision.
- You may also want to bring a zip- or button-up long sleeve shirt or jacket in case you get cold.

Frequently Asked Questions

How long will I be in the hospital?
This varies depending on the type of surgery performed. The average hospital stay is four to seven days depending on many variables. The sooner you go home, the lower your risk of complications such as hospital-acquired wound infections, blood clots and urinary tract infections.

How much time off will I need to take from work?
The amount of time needed for recovery prior to returning to work varies depending on the surgery, your job and you as an individual. Typically, eight to twelve weeks is sufficient. However, patients should ask their surgeon for an individual recommendation. Returning to work prior to your first post-operative office visit is not advised.

When can I resume driving?
Driving is acceptable approximately six to eight weeks after surgery depending on the use of pain medication and extent of surgery. We generally recommend that you not drive while taking pain medications following the surgery.

Will I need physical therapy?
We usually recommend physical therapy at a later time when your body and muscles have healed from surgery. The first month home is to get used to being home and your daily activities. We will release you for physical therapy when you are ready. This may be at your first or second post-operative visit depending on your progress. We recommend limited bending or twisting of the lumbar spine. Refrain from high-impact activities such as running, horseback riding, or any radical side-to-side motions. A good rule of thumb is 'If it hurts don't do it.'

What kind of follow-up is required?
Patients return to our office for routine follow-up appointments at intervals that are determined on a case-by-case basis. We typically see patients back in the office within a couple of weeks following surgery and then increase this to several months followed by an annual exam. Your individual needs will be determined by your surgeon at each follow-up visit.

What if we are from out of town/state?
Once you are discharged from the hospital, if you don't require inpatient rehab, you will need to stay in the area for up to one week. We want to make sure that you are functioning and doing well outside of the hospital before we allow you to travel home. You need to make arrangements to stay locally after surgery. Just because you are from out of town doesn't ensure your insurance will approve inpatient rehabilitation. We can arrange daily physical therapy at Baylor Plano during this time.

If you choose to return home early and have issues we will require you to return to our hospital under our treatment. Since your surgery is complex so are the complications and other hospitals/physicians are not familiar with our complex surgery or how we treat complications.

When you are released to return home make sure you have pain medications for the trip and take frequent breaks to walk around and stretch. Depending on how well you are doing the first few weeks after surgery you will be required to come back and see the surgeon anywhere from one to three months.

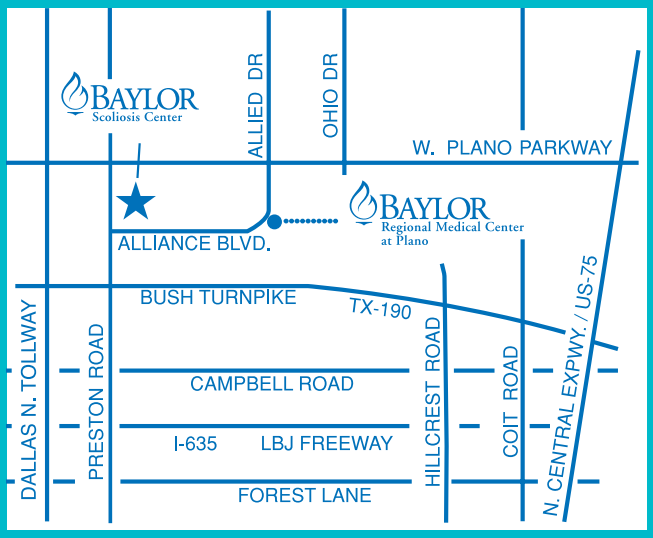
Since you are not located near our practice, when you return home you will want to notify your primary care physician. Your staples can be removed by your primary care physician or home health nurse two to three weeks after surgery date. If you have certain problems when you get home, we may refer you to see your PCP or you may have to travel back to Plano to be seen. Periodically you will be asked to have films completed in your hometown and sent to the office for review

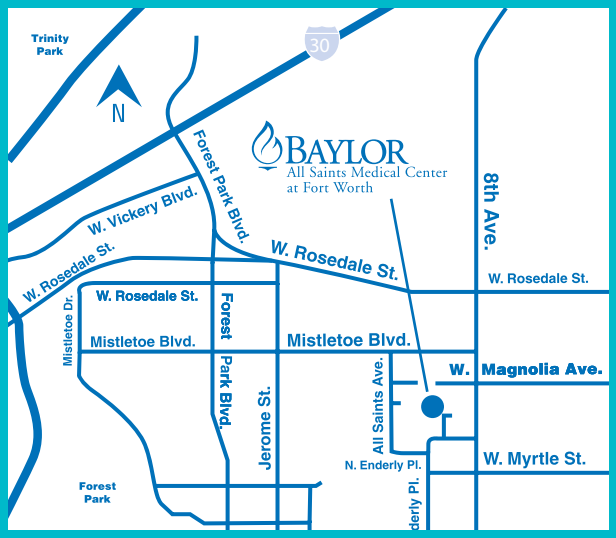
What about short-term disability/FMLA forms?
The office will complete any necessary short term disability forms for patients undergoing surgical procedures or FMLA forms. Due to the complexity and volume of requests, please allow three to five business days for the disability/FMLA forms to be completed. If you are on disability or require completion of disability forms, please complete as much of the disability form as possible prior to your visit. Provide the form to the office at the time of your visit, or send it by mail. The form will be carefully reviewed and signed. Make a copy so you can fill out the future disability paperwork. If the paperwork needs to be faxed, have the fax number available. This will expedite your disability paperwork.

*If patient requires long term disability, they will be referred back to primary care or to a long term disability physician.

I came down with a fever after surgery, should I be concerned?
Post-op fevers are common and due to many things. You should call the office if you develop any of the following:

- Elevated temperature greater than 101 degrees Fahrenheit.
- Drainage from the incision site and/or excessive redness of the incision.
- Excessive sudden pain from the incision site or progressive pain from the incision site.
- Sudden weakness, excessive numbness/tingling or burning pain in the arms or legs.
- Loss of control over your bladder or bowel.





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