A Patient's Guide

TAYLOR SPATIAL FRAME®
External Fixator
Transform your life
This booklet addresses many of the most frequently asked questions specific to the ILIZAROV™ method of external fixation with the TAYLOR SPATIAL FRAME® device. Please consult your orthopaedic surgeon for any questions and consultation. This booklet is not a substitute for direct communication with your orthopaedic surgeon's office.
Advanced limb correction and fixation technology

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What is the ILIZAROV™ method?

Your orthopaedic surgeon has chosen to use the ILIZAROV (Ill-is-are-off) method of limb correction. The ILIZAROV method is a highly successful orthopaedic surgical technique designed to lengthen or straighten bone and soft tissue. Additionally, this innovative device and technique can sometimes save limbs that might otherwise be amputated.

Although some form of fixation has been used in orthopaedic medicine for hundreds of years, it was Russian-born Gavril Ilizarov who is considered the "father" of circular external fixators. In fact, all circular external fixators today are based on Dr. Ilizarov’s work from the 1950s.

Taking advantage of the remarkable fact that bone heals itself by growing, or regenerating, he determined that he could correct disfigured bones by separating two bone halves millimeter by millimeter. During this process, the body’s natural ability to grow bone fills in the gap between the two bones, correcting deformities or increasing length.

Dr. Ilizarov was able to lengthen legs and arms and treat severely disabled patients with bone trauma or deformities.

Many orthopaedic surgeons around the world today still use the ILIZAROV device and Dr. Ilizarov’s surgical methods.

Core team contacts

The date my surgery is scheduled for is ________________________________
Target date for removal of my external fixator ________________________________

Orthopaedic surgeon
Name __________________________________________
Address _________________________________________
Telephone number ________________________________
Emergency/After hours ______________________________

Clinic nurse
Telephone number ________________________________

My partner
Name __________________________________________
Telephone number ________________________________

Physical therapist
Name __________________________________________
Address _________________________________________
Telephone number ________________________________
Emergency/After hours ______________________________

Home care discharge planner
Name __________________________________________
Address _________________________________________
Telephone number ________________________________

Insurance carrier
Name __________________________________________
Group number ___________________________________
Names of contacts __________________________________
Address _________________________________________
Telephone number ________________________________
Partners in success

Throughout this process, we hope that you remain mindful of the fact that your physical and mental well-being are very important to your team of caring specialists and loved ones. Never hesitate to call on them for help, advice or just to talk. They are dedicated to your success.

Understanding the process

Limb restoration is a gradual process that helps to restore a patient’s bone and soft tissue to normal alignment, length and function. While there are many reasons a patient would choose to have this type of procedure, the primary indications include trauma, congenital deformities and bone or joint infection.

Your orthopedist uses the ILIZAROV™ surgical method to provide limb restoration. This remarkable technique uses a device called the TAYLOR SPATIAL FRAME® to take advantage of the body’s natural ability to grow healthy new bone tissue.

There are two main phases to the correction process: correction/lengthening and consolidation.

Correction/lengthening refers to the period of time it takes to ‘grow the bone.’ This initial phase begins after the surgeon cuts the bone and attaches the TAYLOR SPATIAL FRAME fixator. During this time, you will be working with the physician and your team to make gradual adjustments to the device, which increases the gap between the bone segments, adding ‘length’ to the total limb. Over a period of months, new bone tissue will grow in the gap, ultimately hardening the area between the segments of the original bone.

When your surgeon is satisfied with the length and position of the new bone, the consolidation phase begins. During this phase, the bone tissue matures and becomes solid. You still wear the TAYLOR SPATIAL FRAME fixator, but you will not make adjustments. The consolidation phase is the longest part of the ILIZAROV process.
Conditions treated

There are many different medical conditions where use of the TAYLOR SPATIAL FRAME™ device is prescribed. The external fixator can be used to correct arm and leg length discrepancies and deformities including:

- **Injury and trauma** including growth plate fractures, malunion (where the bones heal crookedly), nonunion (where the bone doesn’t heal together), shortening and deformity due to bone loss.

- **Congenital limb length discrepancies**. These conditions are associated with many birth defects and deformities including a short femur (thigh bone), otherwise known as fibular hemimelia. Pseudoarthrits in which the bone fails to fuse together such as in a fracture healing site. And hemiatrophy, where the bones of one side of a child’s body may grow smaller than the other side.

- **Short stature including Achondroplasia and other skeletal dysplasias and Constitutional Short Stature**. External fixators can be effective in treating limb length discrepancies linked to dwarfism. Treatment may be appropriate in some cases in order to allow the patient to function more independently.

- **Infection involving the bone (osteomyelitis) and joint (septic or infectious arthritis)**. Treatment of bone infection often requires removal of bone segments which may result in angular deformities and limb length discrepancies.

- **Developmental causes** which are related to the slowing of growth and limb deformities caused by illnesses such as Blount’s Disease, which typically affects the bone development of overweight toddlers and adolescents.

- **External fixators are also used in the treatment of pediatric hip disorders** such as Developmental Coxa Vara (DCV), Perthes Disease and Slipped Capital Femoral Epiphyses.

- **Joint stiffness following injury, infection** or other causes can sometimes be addressed by controlled joint distraction (arthodiatasis), with the use of external fixators.

- **Clubfoot (talipes equinovarus – TEV)**, a congenital defect where bones of the foot and ankle are not in alignment can be corrected with external fixation.

- **Bone fractures in conjunction with soft tissue damage such as burns** can be addressed with external fixation because it is a minimally-invasive external device that allows for skin tissue healing while correcting bone fractures at the same time.
Frequently asked questions

How fast can bone grow?
Your bone can grow up to one millimeter per day.

How long do I have to wear the external fixator?
Typical external fixator patients wear the device from four to twelve months. The severity of the problem you need reconstructed, your health, weight and other factors play a role in the length of time you will need to wear the external fixator. Your surgeon will be able to provide you with a timeline for your specific case.

What are the stages of lengthening/correction?
Correction/Distraction – This begins a few days postoperatively when you will begin the process of moving the struts as directed to create a space between your bones to promote bone growth. Typically, you will adjust the struts four times a day, every six hours, approximately 0.25mm each time, for a total of 1mm in a 24-hour period.

Consolidation – During this time period you will wear the external fixator, but you will not adjust the struts. This allows time for the new bone growth to consolidate (strengthen) and prepare for removal of the external fixator.

How is the TAYLOR SPATIAL FRAME® device attached and removed?
You will have at least two surgeries related to the TAYLOR SPATIAL FRAME device. Both the installation and the removal of the device will require a surgical procedure.

There is the possibility of serious complications with any surgery. Your surgeon will not schedule you for surgery unless he feels that you are healthy enough to have the procedure. Discuss possible complications and what to expect with your surgeon.

Only after X-Ray exams of the consolidated bone show it is completely healed will the TAYLOR SPATIAL FRAME device be removed. This will be performed under general anesthesia, usually as an outpatient surgical procedure. Afterwards, you may have to wear a brace or a cast, to give the bone more time to heal.

You may have certain physical limitations at first, depending on your bone healing progress and specific situation. Consult your surgeon about your limitations.

What is the TAYLOR SPATIAL FRAME® External Fixator?
The TAYLOR SPATIAL FRAME fixator is an external device for limb correction, lengthening and/or straightening that is based on the ILIZAROV™ method. This external fixator takes advantage of the body’s natural ability to grow healthy new bone tissue and gives the surgeon the ability to accurately move bones to their correct anatomic alignment.

The TAYLOR SPATIAL FRAME device fits around your limb and is attached to the bone with pins or wires that extend from the rings, through the skin and bone to the other side.

The TAYLOR SPATIAL FRAME device is a circular, metal frame with two rings that connect with six telescopic struts that can be independently lengthened or shortened relative to the rest of the frame. This allows for six different axes of movement, which gives the TAYLOR SPATIAL FRAME device the ability to correct even the most difficult congenital deformities and trauma cases.

When using the TAYLOR SPATIAL FRAME device, your surgeon inputs information about your original bone deformity into an advanced web-based computer application. This information is then interpreted by the software and a day-by-day treatment plan is created. The software also creates an image of your deformity on screen and shows how the bones should be moving each day, until the bones are completely set in proper alignment.

You then make daily adjustments to the struts, depending on your prescribed course of treatment. As the adjustments are made, the rings are repositioned with respect to each other, moving bones in the directions necessary for treatment.

Your surgeon is able to make a side-by-side comparison of current X-Rays and the projected plan of treatment graphics created by the TAYLOR SPATIAL FRAME device software. This comparison ensures that your bones are healing in the correct alignment and at the appropriate pace.

The TAYLOR SPATIAL FRAME External Fixator is a winner of the Medical Device Excellence Award.
Planning ahead

As other TAYLOR SPATIAL FRAME™ device patients might tell you, the limb restoration process takes a great deal of preparation and personal commitment. One of the best ways to understand the process is to speak with someone who has gone through the process. Ask your surgeon to introduce you to someone who would be willing to talk to you about their experience and help you prepare for this temporary lifestyle.

Here are some points to consider before you receive the TAYLOR SPATIAL FRAME device:

- **Hospitalization:** You should plan for a hospital stay of at least three to four days. Ask your surgeon for help in planning what to bring with you and what to expect.

- **External Fixator Adjustments:** Make the commitment now to follow a schedule of fixator adjustments, which are needed daily during the lengthening/correction phase. Your prescribed course of treatment will be determined by your surgeon.

- **Scheduling Considerations:** Plan ahead now for the amount of time away from school or work, frequency of clinic visits, time of year and transportation issues you’ll face. Your surgeon’s clinic can assist you with making these plans.

- **Physical Limitations:** Understand ahead of time what you will be able to and won’t be able to do. Talk to your surgeon about what to expect.

- **Changes to Normal Activities:** Preparation, more time, energy and rest will be needed to perform daily activities.

- **Clothing Adaptations:** Make arrangements to wear loose clothing, which will fit over the fixator. See pages 14 – 15 for more information about clothing modifications.

- **Insurance Coverage:** Know your insurance plan and make sure to secure all approvals prior to surgery. Find out what your insurance will cover for medical equipment as you will need several medical items during your external fixator treatment time. Your surgeon’s clinic can give you a list of items that you may need to give to your insurance company.

- **Household Furniture and Linens:** Your furniture and linens can be protected from damage caused by the fixator by wearing a protective covering over it. See page 15 for more information about external fixator covers.

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After treatment

After the TAYLOR SPATIAL FRAME device is removed, you may have to wear a cast or a brace on the limb that was lengthened or corrected for a period of time. This will give your bones a little longer to heal and consolidate (strengthen). The length of time that you may have to wear a brace or a cast is dependent on how well your bone has consolidated. Your surgeon will make the determination whether you will require a brace or a cast.

You surgeon will likely recommend that you continue your exercises and increase your activity level. Motion and bearing weight on your affected limb promotes bone healing and strengthening.
Pin-tract infections

Because you will have pins and wires going through your skin into your bone, there is a risk for pin-tract infections. With proper cleaning, protection and care of your pin sites, you may never have an infection – which is the goal. Call your surgeon if you experience any of the following symptoms:

• Redness, warmth and swelling at the pin sites.
  A small amount of redness is normal.
• Extremely tender pin sites.
• Persistent fever of 100.5 degrees Fahrenheit or higher - taken orally.
• Thick, cloudy, white, yellow or green drainage from the pin sites. Clear yellow or slightly bloody drainage is normal.
• Odor at the pin sites.

These are all warning signs of infection. Call your surgeon’s clinic promptly. Early treatment is mandatory. To prevent complications and infections from spreading further, oral antibiotics and increased pin site care may be needed.

Nerve problems

If you experience pain in a place where there are no pins, this may be the first sign of a nerve problem. This is called ‘referred pain.’ The next sign is an increased or decreased feeling in the area of your foot or hand, depending on where your external fixator is located. You could experience these symptoms during the initial correction phase of your treatment with the TAYLOR SPATIAL FRAME fixator.

Report these symptoms to your surgeon as soon as possible. They may be indications of nerve irritation.
Your core team

You will need a special team of loved ones and specialists to guide you through the process of wearing the TAYLOR SPATIAL FRAME® device. Since your orthopaedic surgeon has chosen you as a candidate for limb restoration, you should know that your surgeon already has confidence in your potential for success. Knowing and utilizing your core team will help you set realistic goals so you will know what to expect at the end of the process.

Be sure to write down the names and telephone numbers of your core team to have on hand at any time that you need them during your journey with the TAYLOR SPATIAL FRAME device. To assist you, you may use the My Core Team Contacts sheet located at the back of this booklet on page 29.

Showers with the external fixator

You may not be allowed to shower for approximately five to seven days after initial placement of the TAYLOR SPATIAL FRAME® device. Until you are allowed to shower, your surgeon may have you clean the pin sites with cotton swabs and normal saline or other topical cleaner or antibiotic that your surgeon prescribes. During the first few days after the external fixator is placed, expect a clear yellow or slightly bloody drainage from the pin sites.

As long as there are no open wounds and your surgeon allows it, you can shower with the TAYLOR SPATIAL FRAME device in place. You may consider placing a rubber mat in the tub or utilizing a shower chair or installing handrails in your shower for safety. When you are released to take showers, cleaning the pin sites with an antibacterial liquid soap and water while in the shower has proven to be a simple and effective pin site care method. Allow the soap and water to run down the extremity that the external fixator is attached to. Do not scrub. Rinse and dry the fixator and the extremity thoroughly. You can dry using a hair dryer on a cool setting.

Any activities that involve soaking the external fixator in potentially contaminated water are discouraged. That means no natural ocean waters, rivers, etc. Your surgeon may, however, allow you to swim in a clean, chlorinated pool after your sutures are removed.
Pin tract sites

The TAYLOR SPATIAL FRAME™ device is attached to the outside of your limb with pins and wires that penetrate your skin through your bone and out the other side. Pin tract sites are where the pins and wires go through your skin.

Infection is a common problem around these pin sites, but may be avoided with proper pin care. You will have a major responsibility to make sure that the pin site areas are cleaned daily - you must take vigilant care to keep the pin tract sites clean and free of infection.

Pin site care

Your surgeon will guide you in the proper care and cleaning of the pin sites. You will need to learn how to remove dried blood and scabs from the pin sites to keep your skin from adhering to the pins and allow free drainage of your pin site. Gentle massage around the pin sites may also help to keep your skin from adhering to the pins. Be gentle when you massage around your pin sites as excessive skin motion on the pins may cause infection. If you have difficulty reaching or seeing all the pin sites, have a family member or friend help, or you can use a mirror.

Make sure that you follow your surgeon's recommendations for proper pin site care to avoid infection.

You – You are the most crucial team member because your active participation is valuable to the success of the limb correction process. You will be required to assist with external fixator adjustments, as instructed. Without your dedicated commitment and important feedback along the way, other team members cannot operate as effectively in their roles.

Significant Other – It is important that a parent, sibling, spouse or close friend – someone dedicated to your well-being – be involved in the process from beginning to end. They need to understand the procedure and what to expect as well as you do. They also need to participate in the planning process.

Orthopaedic Surgeon – Unlike some areas of medicine, limb correction requires that your surgeon be involved in every phase of the process. He or she makes the initial evaluation, performs the operation to apply the TAYLOR SPATIAL FRAME™ device, plans your recovery goal and closely follows your progress. The surgeon may have an orthopaedic resident, nurse or physician's assistant specifically trained to help with the surgery, and frame construction and modification.

Orthopaedic Clinic Nursing Staff – Your clinic nurse will coordinate the work of the entire team through each phase of your treatment. Your nurse is often the first person to answer questions, listen to concerns and advise you about problems as they arise.

Physical Therapist – Your physical or occupational therapist will conduct a preoperative assessment of your movement ability and will work with you throughout the process to help you stay as active and independent as possible.

Home Care Discharge Planner – A home care discharge planner will be available before and after surgery to talk about your concerns. They can also help you solve logistical problems such as transportation, temporary housing and rental of medical equipment such as wheelchairs and/or crutches.
Your well-being

Although you will have a great deal of support available during the process, you are your own strongest support system. Your most important job is to take care of yourself.

Wearing an external fixator can be stressful. Keep these factors in mind while you’re going through the process:

• Know that the discomfort associated with wearing an external fixator is usually mild.
• Anticipate early mobility.
• Keep a good attitude and a sense of humor.
• Keep thinking about the vastly improved quality of life you will have at the end of your treatment.
• Actively participate in your care.
• Normal activities of daily living may be more time consuming so allow enough time for these activities to avoid frustration.
• Keep active. Go to the movies, go out to eat, attend football and baseball games, and visit with family and friends.
• Keep your mind busy by reading books, listening to music, exercising, relaxing, crossword puzzles, etc.

Ways to alleviate pain

• Follow your doctor’s instructions regarding exercises. Do not allow your knee, ankle or elbow to become stiff.
• Keep the pin sites clean.
• Elevate the affected extremity while at rest, securing position and proper alignment to decrease pain and swelling.
• Practice relaxation, distraction and imagery techniques to calm yourself and relax your muscles.
• Contact your physician promptly if you experience increased pain, discomfort or swelling not relieved by rest.
Physical therapy (cont.)

To avoid complications, your exercise program should be followed with commitment and discipline. You may be able to walk, ride a stationary bike and swim in a chlorinated, clean pool (after your sutures are out). You must bear weight on the limb being treated with the external fixator, after you’ve been released by your surgeon to do so, or you may not heal properly. You must exercise your affected extremity to increase blood flow and grow healthy bone tissue. For a leg fitted with the TAYLOR SPATIAL FRAME device, that means walking. For an arm fitted with an external fixator, that means using small weights. Putting weight on the treated extremity promotes healing.

Whatever the method, exercise is critical for a speedy recovery. Check with your surgeon and your physical therapist for specific instructions.

Pain management

Pain management is essential to your well-being and recovery. Pain may decrease your desire and ability to walk or move your arm and actively participate in physical therapy. Pain may also cause the adoption of protective postures, which may lead to joint stiffness and decreased joint mobility. Although the process of the bones moving should not be painful, poor pin care may cause the skin around the pin sites to become taut, causing pain at the level of the skin.

Your positive attitude through the ILIZAROV™ process is important to its success. This means you will have to find ways to cope with discomfort, pain and frustration – in addition the natural ups and downs of your emotions during this long process. Whenever possible, tell your surgeon or nurse what is troubling you, and be prepared to experience some degree of pain from the beginning. The pain should, however, always be manageable. Each individual experiences pain differently. Whatever the degree of your pain in the beginning, it should get progressively better.

The first few days after the initial surgery, it is likely that you will feel considerable pain or discomfort. Your surgeon has planned for this and will administer pain medication as needed. You may receive pain medication intravenously for a few days.

Nutrition

Attention to nutrition is an important way to ensure the speedy healing of new bone. In addition, you need to keep the rest of your body in good shape for the extra physical demands. A well-balanced diet with adequate protein, minerals and vitamins is needed for healthy tissue and wound healing. A dietician can instruct you and your family about diet and can answer general nutrition questions.

Your surgeon may prescribe calcium supplements.

Avoid drinking sodas and other drinks which contain excessive phosphoric acid. Phosphoric acid may decrease the amount of calcium the body absorbs.

Weight

If the external device will be on your leg(s), you may have to use crutches for a period of time. When walking with crutches, you do not want any extra body weight because it will increase fatigue, leading to a decreased amount of exercise. Your surgeon may suggest a weight-control diet to help you achieve and maintain your ideal weight.

Stop Smoking

Avoid smoking and second-hand smoke. The nicotine in cigarettes interferes with bone formation and harms the body’s ability to heal. Nicotine patches cannot be worn because they produce the same bad effect. Your surgeon may perform blood tests to ensure that there is no nicotine in your body prior to surgery. Talk with your surgeon about smoking cessation programs and/or medications if you need help to stop smoking before your surgery.
Adjusting the TAYLOR SPATIAL FRAME™ device

If you are having a limb lengthened or corrected with a TAYLOR SPATIAL FRAME device, you will be required to assist in the process by making external fixator adjustments to the struts at home. This adjustment is made daily. An adjustment plan will be tailored specifically for you and it is imperative that you follow the adjustment schedule exactly.

Your surgeon will make sure that you are trained and understand how and how often to make the adjustments. Your frame adjustment schedule may change at each clinic visit depending on how you progress according to analysis by your surgeon and the TAYLOR SPATIAL FRAME web-based software.

There may be times when you experience some failure of the mechanics of the external fixator, such as broken or bent wires or pins or when you are unable to turn the strut(s). If this happens, call your clinic promptly.

Clothing modifications

Depending on where your TAYLOR SPATIAL FRAME device is placed, you will have to make clothing modifications and adjustments to your wardrobe.

If the external fixator is on your leg:
- Snap-on sports pants or shorts may be the most comfortable articles of clothing to wear. Some snap all the way up to the waistband, making them easy to get on and off.
- Pants can be altered by cutting the inside seam, up to the crotch, or the outside seam, up to the waistband, and inserting triangular pieces of fabric to widen the leg.
- You can secure the extra fabric inserts with hooks and loops or with buttons.

Physical therapy

Within several days of your surgery, you will begin a thorough and on-going rehabilitation program designed to improve the blood supply to the limb and promote healing.

If you are having a leg lengthened or corrected, you will begin physical therapy in the hospital until you can walk. Your physical therapist may teach you exercises to help you develop sitting and standing balance, stability and coordination to prepare you for mobilization and ambulation.

If you are having an arm lengthened or corrected, you will begin physical therapy in the hospital until you are able to use the arm for a range of daily care.

Learning to walk with balance and stability or using your arm with coordination after the external fixator is attached usually takes three to four days.

Your therapist will design a home-exercise program encouraging you to maintain the limb’s range of motion and strength. Their objective is to help you become as independent as possible to cope with the external fixator and promote healing.

Your exercise program is your surgeon’s prescription. The exercise program designed for you will depend on the type of correction or lengthening treatment you are undergoing.

Aerobic activities increase blood flow and strengthen bones. It burns calories, increases resistance to disease and decreases tension. It also releases endorphins – the body’s own pain-control system.
Getting around with the external fixator

Immediately after surgery, the affected extremity should be elevated above the level of the heart until there are no concerns about swelling. To elevate the affected extremity properly, place a pillow under the heel of your foot so your knee is extended fully.

To move the affected extremity, the leg external fixator must be moved together as a unit. The amount of assistance needed depends on your ability to control the leg during the move. Make sure not to place your hands under the fracture site during movement. This may cause you to apply stress and even slightly manipulate the fracture site.

Standing up and sitting down

When standing up with a leg in a TAYLOR SPATIAL FRAME™ device, you must use caution so that you do not fall. Always be very careful when sitting down or getting up from a chair if the external fixator is on your leg.

To stand up, move forward to the edge of the chair. Push off against the seat using the hand on the affected side. Push down on the hand piece of your crutch while raising your body to a standing position.

To sit down, back up to the edge of the chair. Hold on to the hand piece of your crutch on your unaffected side. Lower the hand on your affected side to the arm of the chair to lower your body to a sitting position.

Using the toilet

Again, while performing some daily activities with a leg in the TAYLOR SPATIAL FRAME device, you must use caution to prevent falling.

Follow the same steps used in sitting and standing for getting on and off the toilet. You may consider using an elevated toilet seat. For safety, you may consider placing a handrail beside the toilet.

Sleeping

Your body may require more sleep during the treatment process with your TAYLOR SPATIAL FRAME device, due to increased demands in ambulation. The fixator adds extra weight and increased time to maneuver as you go about your day.

Your sleep will be limited to one position – your back. Elevate the limb with the external device for comfort and security. You may want to sleep with the fixator frame cover on to avoid ripping the sheets.

- Consider pants with many pockets for carrying multiple items throughout the day.
- During warm weather, you may wish to wear shorts or cut off pants above the external fixator.
- For women, loose-fitting dresses or skirts may be your best option. Underwear that ties on both sides at the hip can be used.
- Underwear can be altered by cutting the side seam and using hooks, loops or Velcro® to secure the cut seam.

If the external fixator is on your arm:

- Shirts can be altered by cutting the inside seam of the arm of your shirt and inserting triangular pieces of fabric to widen the arm hole.
- You can secure the extra fabric inserts with hooks and loops or with buttons.
- You can use a shawl or cape to keep warm during colder weather.
- You can cut the cuff off sweaters and shirts to enable the shirt to fit over your arm.

If the external fixator is on your foot:

- You may need to modify a pair of shoes.
- A foot ring with a rubber sole can be added to the fixator. Ask your surgeon about this.
Clinic visits
You will have a significant number of surgeon clinic visits during your TAYLOR SPATIAL FRAME® device treatment. Be sure to discuss this with the home-based team member who is helping you during treatment.

During the lengthening/correction phase, you may visit the clinic every two weeks so that your surgeon can monitor how you are progressing.

During the consolidation phase, you may visit the clinic once a month. Office visits may range from 30 minutes to two hours, depending on what work or evaluations need to be performed.

Follow-up visits may include:
• Measuring the distraction amount since your last visit.
• Assessing the range of motion of the joints above and below the external fixator for contractures. Contractures occur when the joint is not exercised. Without exercise the tendons and muscles shorten causing joint deformity, stiffness, limited mobility and pain.
• Checking the pin sites for inflammation or infection.
• Checking the external fixator frame for loose wires, nuts and bolts.
• Taking X-Rays to check the rate and progress of the lengthening/correction and assess the quality of the new bone growth.

Ambulation with crutches
During the correction phase while wearing the TAYLOR SPATIAL FRAME® device, you may be required to use crutches if your leg is the affected limb. Your surgeon will prescribe a weight-bearing status for you to walk, either partial weight bearing or full weight bearing, which will determine whether or not you will be required to use crutches.

Before walking with crutches, it is important that you are fit properly for them and that you know how to walk correctly and safely. Your physical therapist will teach you techniques for standing, walking and maneuvering yourself with crutches. With a little time, practice and patience, you will learn how to walk with crutches.

• Crutches should be custom adjusted to your body size.
• Make sure you have a thick foam rubber pad on the underarm piece to relieve pressure of the crutch on the upper arm and thoracic cage (ribs). Never put pressure in the axilla (armpit) when using crutches.
• Weight should be supported on the hand pieces to avoid damage to the nerves under the armpits (brachial plexus nerves), which can cause ‘crutch paralysis.’
• Crutch walking can take a toll on the hands. Protect your hands from pain and calluses by using hand-piece pads in good condition.
• Long-term crutch users may benefit from new shock absorbing crutches.
• If you are getting numbness in the hands, have your physical therapist check your crutch length and crutch technique.
• Ask about Canadian Crutches.
• Keep your body weight down.
• Make sure your crutches have large rubber suction tips.
• Good balance and erect posture are essential for crutch walking. Learn to balance by standing next to a chair on the unaffected leg. Wear well-fitting shoes with firm soles to prevent falls.
• Stay away from wet, slippery surfaces, freshly waxed floors and rough, uneven surfaces.
• Going up and down stairs requires both strength and flexibility. Make sure someone is by your side until you have regained your strength and mobility.
• To go up and down stairs, remember – up with the good leg, down with the affected leg.