



Decompressive Lumbar Laminectomy for Spinal Stenosis

By:

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Outpatient Lumbar Laminectomy for Spinal Stenosis A Patient Education Module

Figures 1 and 2 below show examples of Spinal Stenosis in the low back. Both of these pictures are classic examples of how the space available for the spinal nerves is compressed from overgrowth of bone and arthritic spurs. This can compress the spinal nerves at that one or several levels. This nerve compression can lead to back and/or leg pain, and numbness and weakness in the legs and feet especially with walking or standing for long periods.

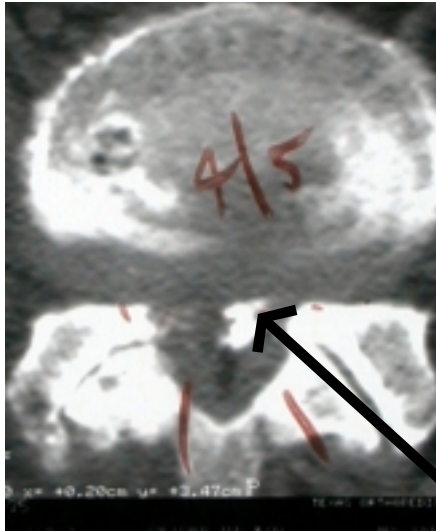


fig 1 Ct myelogram showing narrowing of spinal canal (see arrow to Small white area)

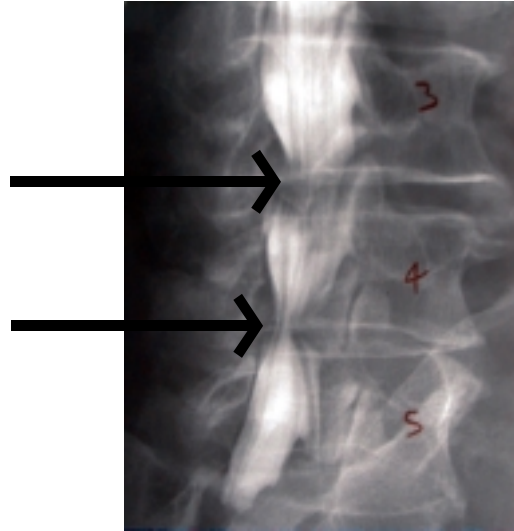


Fig 2. Showing hour glass narrowing of spinal canal (see arrows)

Often times, spinal stenosis can be treated for some time successfully without surgery. However, if your symptoms have not responded to anti-inflammatory medicines, physical therapy, lumbar epidural steroids, and time, surgery may be necessary. If left untreated, the compressed nerves can become permanently damaged and lead to irreversible nerve damage.

This patient education module will explain the surgical procedure used to decompress the spine and describe the steps you will follow during your postoperative care.

SURGICAL PROCEDURE

The surgical procedure that you need is called a Lumbar Laminectomy. The goal of this procedure is to decompress the spine. This recreates the space needed for the nerve roots, so that the compression of the nerve root is lessened.

This procedure is performed through an incision in your back. The incision is usually placed along the midline of your back.

During surgery, the muscle of your back are gently retracted to the side for protection. Once the spine

itself is exposed, special retractors are used to hold the muscles out of the way. X-rays are used to determine the exact level of the bone and or disk's) to be removed. The removal of the arch of bone overlying the spine is accomplished with a special drill and spinal instruments. During this procedure Dr Heilman must reopen the space needed for the spinal nerves. The nerves are enclosed in a sack called the durra. Occasionally this sack is so thin or scared that a hole is present in the sack after it is relieved of the compression. This is referred to as a dural tear. This requires further surgery to close the hole so that spinal fluid will not leak out. Additionally during this decompression Dr Heilman may find that the spine is unstable after the bone is removed and this may necessitate a fusion. This is rare but can occur. If a fusion is needed titanium rod is sometimes attached to the spine with screws to provide added stability. Dr. Heilman usually uses this rod with patients who are:

- smokers
- having revision surgery
- having a single or multiple level fusion
- having gross motion seen on bending x-rays

Dr. Heilman will discuss with you the number of levels and type of decompression you will need. Fortunately, most of the time, a fusion is not needed.

If you do not require a fusion, you can usually expect to go home 2 to 3 days following surgery. You will then return to the office 7 to 10 days after surgery for a follow-up visit. Further follow-up visits will be made for 6 to 8 weeks intervals or until your symptoms have recovered or the fusion is completely healed. A Fusion take 6 to 9 months to heal, A Routine decompression will take 6 to 12 weeks following surgery to heal.

The success of a lumbar laminectomy depends on three main factors. These factors are discussed below.

- 1) The recovery of the nerve and spinal cord function are dependent on how much permanent nerve damage you suffered before your surgery. Most people have excellent return of nerve function. Dr Heilman may order an EMG preoperatively to determine the extent of permanent nerve damage. The more levels involved, the more difficult recovery is due to the multiple nerve roots involved. If you have a medical condition such as diabetes the nerve recovery is variable sine the diabetes effects the nerves as well
- 2) Proper healing of the bone fusion (when performed) provides stability to the spine. For this fusion to occur, you will need to restrict your lifting and sporting activities until the graft has healed. Once the fusion is healed, you may resume most activities that involve contact. There are 5 levels in your lumbar spine. Unfortunately, there is small chance that over time, you could repeat the same injury at another level in your low back. The incidence of this is low, but very real.
- 3) The recovery of normal range of motion and function requires that you complete the prescribed postoperative rehabilitation program.

INSTRUMENTATION

If you have a fusion, it may be necessary to use instrumentation. Considerable controversy exists regarding the use of plates and screws to stabilize the spine during a spinal fusion. In the past, spinal fusions were performed without plates and screws so that immediate stability was not present. With the newer instrumentation systems,

immediate stability is achieved in the operating room, which allows for an improved fusion rate and rapid mobility (Figure 3). The literature is full of contradicting opinions about when to or not to use instrumentation, and how effective the fusion rate is improved. Dr. Heilman believes that when instrumentation is used, there is a marked reduction in the amount of pain patients experience after a fusion operation. Dr. Heilman has also seen greater rates of bone fusion with instrumentation, especially when two or more levels are fused.

The advantages of instrumentation greatly outweigh the disadvantages. Fusions have been performed for years without plates and screws; the use of plates can be avoided if you are willing to accept a lower success rate and the need for long-term bracing. If you have any questions or concerns regarding the use of plates and screws, be sure to notify Dr. Heilman so that an appropriate, educated decision regarding your surgery can be made.

ADVANTAGES & DISADVANTAGES

A Decompressive Lumbar laminectomy is **not intended to cure or treat back pain**. This operation will work very well for leg pain and weakness in most patients. This operation will not make your back normal. Usually patients get 60 to 70 percent relief in leg pain when they have recovered from surgery. Unfortunately this operation is a reconstructive surgery at 1 or several levels in your spine. Over time the spurs and disk may further degenerate and a few patients may require additional surgery at the same levels or at new levels.

There is a chance with any surgery that you may not get better or worse, but that chance is small.

Pain is present after any surgery. The pain after this surgery is very minimal. If you have a fusion, the bone donor site is the most common site of pain, but it is not debilitating. Narcotics will be used postoperatively, as needed to make you comfortable. Many patients experience nausea with narcotics, but are able to take Tylenol or Nsaids such as Advil for pain relief.

The primary disadvantage of a laminectomy is that a portion of the disk and bone are left in your back. Three to five percent of the time, this remaining portion of the disk will re-herniated, requiring further surgery and a possible fusion.

COMPLICATIONS

There are potential complications associated with any surgical technique; however, the complication rate for lumbar laminectomies is quite low. The most likely complication is that of a continual back pain or spinal instability which develops after surgery at a later time. If you have had a fusion a psudarthrosis may develop. This condition develops if the bone graft fails to heal and motion persists. The success rates of fusions to heal are different depending upon whether instrumentation is used (see Instrumentation section) and varies depending on the number of levels fused. The greater the number of levels fused the less likely they will all heal.

Clinical success rates are different than bone fusion success rates. Some patients may have a solid fusion and still have pain. Clinically the success rate is very good with greater than 80% improvement in function with one level primary surgery. Generally, the greater the number of levels or the more surgeries involved (i.e., revisions), the lower the clinical success rate is.

If psudarthrosis occurs, then an additional spinal fusion may be necessary in the future. All other complications are exceedingly rare and occur in less than 3 to 5% of Dr. Heilman's patients. These complications include:

Scarring. Formation of scar tissue around the nerves.

Aracnoiditis. Formation of scar tissue within the spine.

Infection. Dr Heilman's infection rate is less than 1 % on primary Back Surgery in Healthy patients. Those patients who have diabetes or revision surgery the risk for infection is higher, and represent a possible complication with any surgical procedure; If an infection occurs it may require multiple further surgeries and 6 weeks of iv antibiotics. If you have dental work and have instrumentation in your back you should always be on antibiotics to prevent accidental contamination of your back from bacteria in your mouth.

Dural Tear. A tear in the sack that surrounds the spinal nerves. If a dural tear occurs, it usually occurs at the time of surgery. A suture or graft is easily used to repair the tear. Rarely patients may require additional surgery to repair the leakage. A dural tear rarely occurs after surgery, except in patients who have experienced severe vomiting. For this reason, if you have a history of nausea with general anesthesia, please let the anesthesiologist know so that special precautions can be taken.

Blood clots. Although rare, blood clots can develop in the legs or lungs following surgery, requiring blood-thinning medicine.

Bleeding. Although very rare, bleeding around the surgery area can cause swelling around the spinal canal after surgery. This is a surgical emergency and is the reason we keep you in the hospital routinely for two to three hours after this type of surgery. If you have acute return of pain, call our office immediately.



Smoking

Smoking is a major health hazard and can cause complications following surgery. Delayed healing, or psudarthrosis (failure of the bone grafts to heal), is markedly increased in smokers. Smokers also have a higher risk of fluid collection and pneumonia following anesthesia. If you smoke, the most important thing you can do for yourself preoperatively is to quit as many months before surgery as possible. This will allow your bone graft to heal as quickly as possible. Your heart and lungs will also work better after surgery if you quit smoking, which will improve your overall rehabilitation process.

HOSPITALIZATION

Prior to your surgery, you will meet with someone from the anesthesiology department to discuss general anesthesia and any health problems you may have. On the day of surgery, you will sign in at the pre-admit desk and then be escorted to the pre-op holding area (Figure 4). Your family will be able to stay with you in this area. Following your surgery, you will be taken to the recovery room (Figure 5) for approximately 1 to 2 hours. Your family may be able to visit with you during the later stages of this time if the recovery area is agreeable.

Hospitalization for a lumbar laminectomy is 2 to 3 days without fusion and 3 to 5 days with a fusion. The operation itself is extremely well tolerated by most patients and causes some pain after the first night. Patients typically feel a mild degree of back pain, but the primary complaint of most patients is that of achiness. Most patients have dramatic improvement in their leg pain after surgery.

If you require a fusion, the most common site of pain is at the bone graft site. Pain at this site will diminish rapidly but can persist to a lesser degree for a month or two (see Bone Graft section pg 3).

Since the pain associated with a lumbar laminectomy is moderate, Dr Heilman may use an Epidural Catheter in your back after surgery to control pain. This technique is very effective in 90 % of patients but must be adjusted to the appropriate level by the anesthesiologist. If this is used occasionally patients will have a numbness develops in there legs. If this occurs we turn down the medicine and this usually resolves. Please let us know if you experience this. If these measures are ineffective, then a Patient Controlled Anesthesia (PCA) pump will be utilized (Figure 6). The PCA pump is a computerized device that allows you to regulate the amount of pain medicine you receive via your intravenous (IV) lines. It will not allow you to overdose on this medication. The anesthesiology service will typically help you manage your pain while your IV is in. The combination of these medicines seems to provide excellent relief of the minimal pain experienced by lumbar laminectomy patients.



In the recovery room a nurse will be with you all the time until you recover from anesthesia

Bandages will stay in place until the first or second postoperative morning, at which point, they will be removed and a light dressing will be applied. Typically, a urinary catheter is necessary if an epidural is used. This remains in place for 1 to 2 days and is placed after you have gone to sleep in the operating room. If you have a history of prostate problems please notify us so that special plans can be made.

Some patients with 1 level disease do not require a catheter. If you experience difficulty with urination (usually older males), then placement of a catheter may be necessary. The catheter is typically removed on the morning after surgery. This is a quick procedure and is only minimally painful.

Activity in the Hospital

Once you arrive in your room, the nursing staff will assist you with sitting and walking until you are independent. Thereafter, you can stand and walk without concern. It is critical to understand that the most important thing that you can do for yourself while in the hospital is to mobilize quickly. Patients who lie in bed and fail to be aggressive with mobilization seem to have more pain, a higher rate of complications and require a longer stay in the hospital. Your sitting and walking schedule will begin the night of surgery. You will not be allowed to shower while in the hospital since your wound must remain clean and dry until the fourth postoperative morning.

Discharge requirements

Before being discharged from the hospital, you must be totally independent in restroom activities and able to walk a distance of approximately 50 yards without difficulty (two trips around the nursing pods at Texas Orthopedic Hospital). You must also be able to control your pain with oral medicines.

You will be fitted with a lumbar corset prior to your discharge from the hospital. Wear this whenever you are out of bed for the first few weeks after surgery.

POSTOPERATIVE CARE

Wound Care

A new, sterile dressing should be applied to your wounds each morning for five days after surgery. It is common to notice a small amount of bloody drainage for the first three days after surgery. If your wound is dry, you may stop any further bandaging after five days. Expect a minimal degree of tenderness and swelling around the incision site. You should also expect a minimal to moderate degree of redness at the incision site and extending a few millimeters to each side of the incision.

The wound should be kept totally dry for at least the first four days after surgery. Thereafter, (assuming no wound drainage is present), you may begin showering. Exposure of the wound to water should be limited to a relatively brief shower. Do not take baths for 10 days after surgery. Many patients experience dizziness the first time they are in the shower. **DO NOT SHOWER ALONE THE FIRST TIME AFTER SURGERY.** Also an amazing number of patients fall when first showering after surgery.

Small pieces of surgical tape will be placed across the wound; these should be left in place. Typically these tapes come off during the next two weeks in the process of showering, etc. If any residual tape is still in place two weeks following surgery, feel free to remove it.

If you notice increased tenderness, swelling, redness, or drainage from the wound, notify Dr. Heilman's office immediately. If you notice any clear fluid draining from your wound, or if you develop a severe headache,

you should also call Dr. Heilman's office immediately.

Dr Heilman's pager is 713-908-0257 Please use this only for an emergency situation.

Once your wound is totally healed (about two weeks after surgery), a Vitamin E cream or aloe vera can be applied to hasten the maturation of your scar. These creams can be obtained from your local pharmacy. It is important to use sunscreen on your scar for one full year. Failure to do so can lead to more scarring.

Diet

Your diet should be restricted to foods that are easy to digest for the first few days after surgery. You should also drink plenty of liquids.

Activities and Rehabilitation

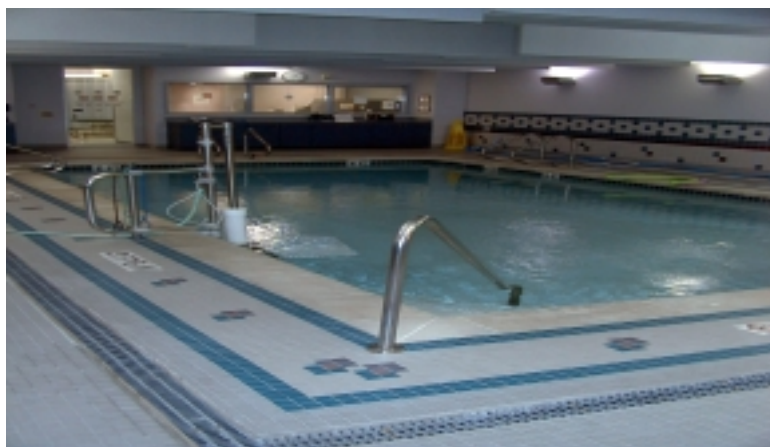
Adequate rehabilitation is crucial for a successful result. **If you have had a fusion this will not begin until the fusion is healed.** You may walk all that you like. Avoid sitting for long periods.

Many patients with spinal injuries have suffered from spinal pain for months or years and have developed considerable atrophy, or shrinkage of the muscles. Rehabilitation of the spine, to accomplish spinal fitness, is absolutely necessary. This rarely requires formal physical therapy.

You should begin an aggressive walking program. As mentioned earlier, you will typically walk a distance of 50 yards or so while in the hospital. This program is continued after your discharge from the hospital, with you walking more and more each day. In general, Dr. Heilman recommends three to five episodes of exercise a day. There is no upper limit to the distance. Stationary bicycling is the only other acceptable form of exercise during this period of healing.

Dr. Heilman recommends a home exercise program so that exercises can be performed several times a day. Many physicians utilize physical therapy but this seems to take much longer, (and is expensive, as only one visit to physical therapy can be arranged on a single day). Dr. Heilman recommends that patients perform the following range of motion exercises every hour while awake.

- 1) bend forward
- 2) unbend backward (back to starting position)
- 3) tilt to the right
- 4) tilt to the left



Water therapy is very useful to regain function following surgery

Dr Heilman will give you a rx for pool therapy to begin at Texas orthopedic and then to follow up at your local pool or health club

Start with the first exercise above. Bend your back forward until moderate tightness is encountered; maintain this position for five full seconds. Return to neutral (or starting) position. Repeat exercise #1 five times. Repeat this same procedure for exercises 2-4. If you perform the exercises as instructed, near normal motion will be achieved in one to two weeks. Remember, do not start these exercises until instructed to do so by Dr. Heilman, which will be after your fusion has healed.

After normal motion is achieved with the exercises described above, you may return to unrestricted activities. If you are a very active person, further rehabilitation is recommended via a swimming program. Swimming three times a week serves well to strengthen the back muscles. After normal motion is achieved, slowly return to your routine activities. The return to recreational athletics should be slow and progressive. For instance, golfers should spend a month or so at the driving range progressing slowly with common sense. Once a half-hour of driving range activities is well tolerated, then nine holes of golf is a reasonable step. Dr. Heilman would be glad to discuss specific activities with you.

Driving

Dr. Heilman recommends that you avoid driving while taking pain medicine. Although this is a considerable imposition, it is not safe to operate a vehicle when you are taking pain medicine. During the initial healing period, it is perfectly acceptable to ride in a car while others are driving. Prolonged trips in a car will produce a moderate back ache for the first few months after surgery. Expect a slow, increased tolerance to driving during the first three to six weeks following surgery. If you have had a fusion this may take longer until the fusion is healed.

Lifting

Lifting weights up to 20 pounds is acceptable during the healing process. Strenuous lifting is to be avoided until a solid fusion is achieved.

Work

Patients who have sedentary jobs often return to work within seven days following surgery, as long as transportation by others can be arranged. If your job involves heavy work, then return to work will not be possible until a solid fusion has been obtained.

Expectations

Recovery from lumbar laminectomy differs from patient to patient. A dramatic, remarkable reduction in pain is usually achieved, with minimal associated operative pain. The relief of leg pain usually occurs immediately, although numbness and weakness in the leg can require months to resolve fully. On occasion, numbness in the leg can be permanent depending on the duration of symptoms prior to surgery.

Back pain resolves more slowly after surgery than leg pain. Some patients (3-5%) do not achieve substantial relief in their back pain and may require a fusion. Increased pain with prolonged sitting and driving should be expected. You should slowly increase your exposure to the activities previously listed, expecting decreased discomfort with time.

It is not uncommon to experience difficulty sleeping during the first month or so after surgery. Dr. Heilman recommends that you avoid naps during the day if you are having problems sleeping at night. It will also help if you can find a comfortable sleeping position. Dr. Heilman would prefer that you do not resort to sleeping medicine.

For patients with a fusion

Once a solid fusion has been obtained and adequate rehabilitation has been accomplished, we expect a dramatic reduction in your preoperative pain. Many patients describe complete relief of pain. There are also a substantial number of patients, approximately 30%, that will persist with ache in their back during various activities and early in the morning. It should be stressed that this discomfort is minimal in nature and represents a vast improvement over the preoperative pain level.

Despite an excellent technical result, 5% of patients will have persistent pain and will be unhappy with their surgical result. If this does occur, then you will be given the option to consider additional studies in hopes that a separate pain source can be identified.

Long-term restrictions

There are no long-term restrictions associated with one level lumbar laminectomy operations other than common sense. For patients with multiple level surgeries or fusions the restrictions will be individual and need to be tailored to your life style. Bungee jumping, 4 wheeling, horseback riding, roller coasters and jobs requiring lifting and twisting, as in heavy construction, may not be possible. Caution is also advised with amusement park rides. In general, Dr. Heilman recommends that you use your common sense.

Medications

The use of narcotic medications is a huge problem for us. Some patients come to our office having been over medicated. Narcotic tolerance and dependency develop extremely easily. In general, we would like to get you off pain medicine as soon as possible.

Ample pain medicine will be given to you while in the hospital to ease operative discomfort. You will be discharged with a course of anti-inflammatory medicine as well as a moderate quantity of pain pills. Mild to moderate pain should be tolerated, and the pain pills should be utilized only when you are unable to cope with your discomfort. Due to the problems of narcotic addiction, no narcotic pain pills will be utilized beyond two months after surgery.

Office visits

Upon leaving the hospital, you should call Dr. Heilman's office to arrange your first postoperative visit, which should be 7 to 10 days following surgery. If you had a fusion, x-rays will be taken to assess the condition of your fusion. You will be seen again in the office six or eight weeks following surgery for your second postoperative visit (depending upon your clinical condition). Further follow-up appointments will be made on an as needed basis.

I have read all 12 pages of the hand out given to me about lumbar decompressive surgery and been given time to talk about my questions with Dr Heilman and his staff. I wish to procede with the surgery.

_____ name date _____

_____ Witness date _____

Patient Informed Consent for
Orthopedic Spinal Reconstructive Surgery
Dr Alan E Heilman MD PA
Fondren Orthopedic Group LLP

Patient Name: _____

Age: _____

Date: _____ Date of Surgery: _____

I have elected to have the following operation by Dr. Heilman and / or associates:

For the following diagnosis:

This operation has been explained in full by Dr Heilman. I have had the opportunity to have second opinions offered to me. Spine surgery never allows a person to have a normal spine. The intent of Dr Heilman's surgery is to improve your condition so that you may be able to function better. Chronic pain is never desirable but may be present after this surgery. Pain improvement of varying percentages is hoped for and attained in most patients. No warranty or guarantees have been given that pain or neurological function will return to normal. You may have continual pain after surgery and may require additional surgery for the removal of disk, bone or implants at the level of surgery or at another level.

Rarely some patients are not better after surgery and their condition may worsen. If you are having a fusion performed some stiffness will occur and it will be permanent. This stiffness may lead to the deterioration of adjacent levels or disks in your spine over time.

I have read the surgical hand out given to me. I understand that Dr Heilman will be the primary surgeon and any assistants will be under his direction. Normally assistants are discussed prior to surgery, but Dr Heilman may find intra-operatively that assistance is needed and arrange for this. I understand that Dr Heilman may have to modify my surgery if additional findings are seen at the time of surgery. I have discussed and directed Dr Heilman to repair these findings as needed. This may alter the levels of surgery, and it may necessitate a fusion with or without instrumentation.

The risks of spinal surgery including death, paralysis, nerve damage, spinal cord injury, bleeding requiring a transfusion, infection and possible osteomyelitis requiring further surgery and long term antibiotics, sterility in males, impotence in males, blood clots in the legs requiring anticoagulation, infection, dural tear, spinal fluid leakage, stroke, vascular injury, hardware loosening and pain, scaring of nerve roots after surgery, chronic pain, injury to the major blood vessels, abdominal herniation after anterior lumbar surgery, recurrent herniation, sympathetic pain, degeneration or instability at adjacent or the same levels of surgery, chronic changes in gait, changes in flexibility of the spine, weakness of muscles, chronic numbness, and bleeding into soft tissues causing compression of the nerves called a hematoma requiring emergency surgery

Cervical operations have additional risks. Those include the above, and the risks of bleeding into the soft tissues of the neck causing compression of the trachea or breathing tube or nerves requiring emergency surgery, swallowing difficulty, horners syndrome with visual changes, hoarseness, and scaring.

THESE RISKS HAVE BEEN DISCUSSED WITH ME BY DR HEILMAN. DR HEILMAN HAS EXPLAINED TO ME THE PROCEDURE I AM HAVING IN DETAIL AND GIVEN ME AMPLE TIME TO ASK QUESTIONS ABOUT THE PROCEDURE. I HAVE NO FURTHER QUESTIONS. AND WISH TO PRECEDE WITH THE SURGERY.

Signed _____ Parent if minor _____

Witness _____ Date _____ Time _____