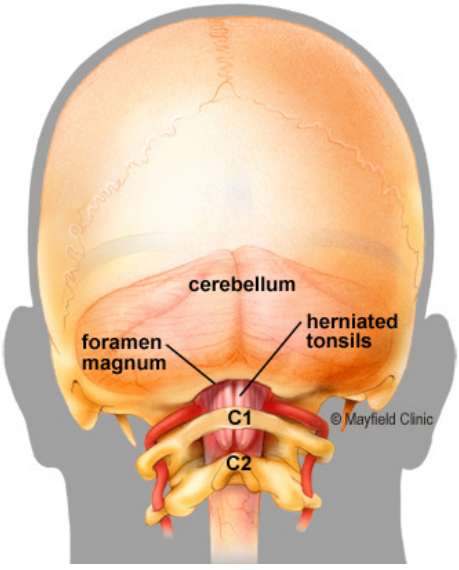
PREMIER NEURO SPINE INSTITUTE
INNOVATIVE BRAIN AND SPINE CARE

CHIARI MALFORMATION REPAIR

Chiari malformations are structural defects that can occur in the cerebellum and spinal cord. These rare abnormalities cause the brain to protrude into the spinal space at the back of the skull.

Most of the time, Chiari malformations are present at birth. These defects can occur much later in life. However, this is not very common. It is estimated that approximately one out of every 100,000 children are born with Chiari malformations.



Candidates for Chiari Malformation Repair

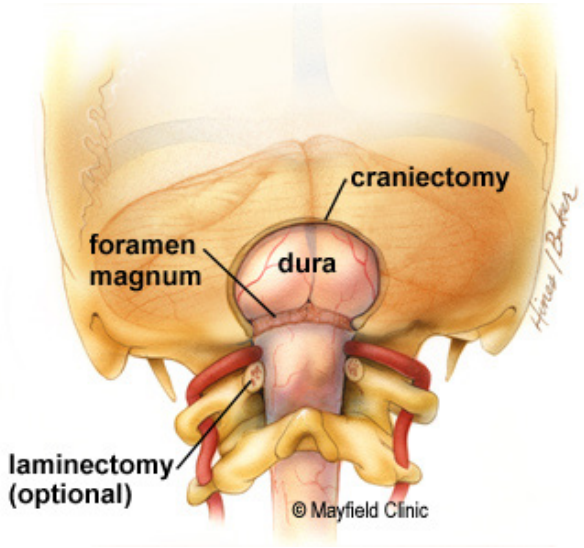
Individuals may be candidates for Chiari decompression surgery when the malformation obstructs the flow of cerebrospinal fluid, or CSF, in the back of the neck and spine, as this can cause symptoms of headaches, neck pain, ringing in the ears, balance problems, and vomiting, However, Chiari malformations may cause no symptoms at all. Chiari malformations are usually confirmed through a cine MRI.

Even though Chiari is typically present at birth, patients generally do not experience symptoms until they reach adulthood. Surgery is not necessary in every case. People who don't experience symptoms may have their condition monitored by their doctor. Those with mild neck pain or headache because of Chiari can be treated with prescription medications.

When the condition is severe and interferes with the activities of daily living, a doctor may recommend surgery.

What is Chiari Malformation Repair?

Chiari decompression surgery is a procedure that is used to relieve pressure on the spinal cord and cerebellum. Chiari malformations can cause changes to the spinal cord and brain if not treated. Decompression surgery can help relieve symptoms and stop the progression of changes.



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Chiari decompression surgery is performed in a hospital with the patient placed under general anesthesia. During the surgery, a surgeon will remove a tiny portion of the skull. In some cases, they may need to remove a small part of the spinal cord, as well. This widens the space available and relieves compression on the brainstem and tonsils.

The most common type of surgery for Chiari malformations is a posterior fossa decompression. During this surgery, a specialized surgeon will relieve compression on the brain and spinal cord by removing a small section of the skull at the back of the head. In rare cases, the removal of a vertebra may be required using a procedure called a spinal laminectomy.

Once asleep, the patient's hair will be shaved to clear the scalp for the incision. The patient's head is placed in a device that holds the head still. This helps prevent the head from moving during surgery.

In some cases, bone removal alone may restore Cerebrospinal Fluid (CSF) flow. If bone removal alone doesn't relieve compression, the surgeon will make a small incision at the back of the head. They will then lift the dura, which is the material that covers the brain, in order to place a piece of scalp tissue called a dural patch, outside the skull. The dural patch is used to enlarge the dura and the space around the tonsils.

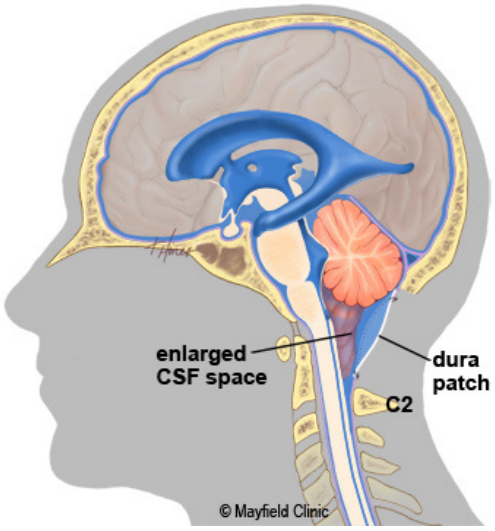
If the herniation is large, the surgeon may shrink the damaged tonsils with electrocautery.

Results of a Chiari malformation Repair Procedure

Results of the procedure vary according to the severity of the patient's Chiari malformation, as well as the extent of existing nerve and brain injury. Between 85 and 95 percent of patients report major relief of symptoms after the surgery.

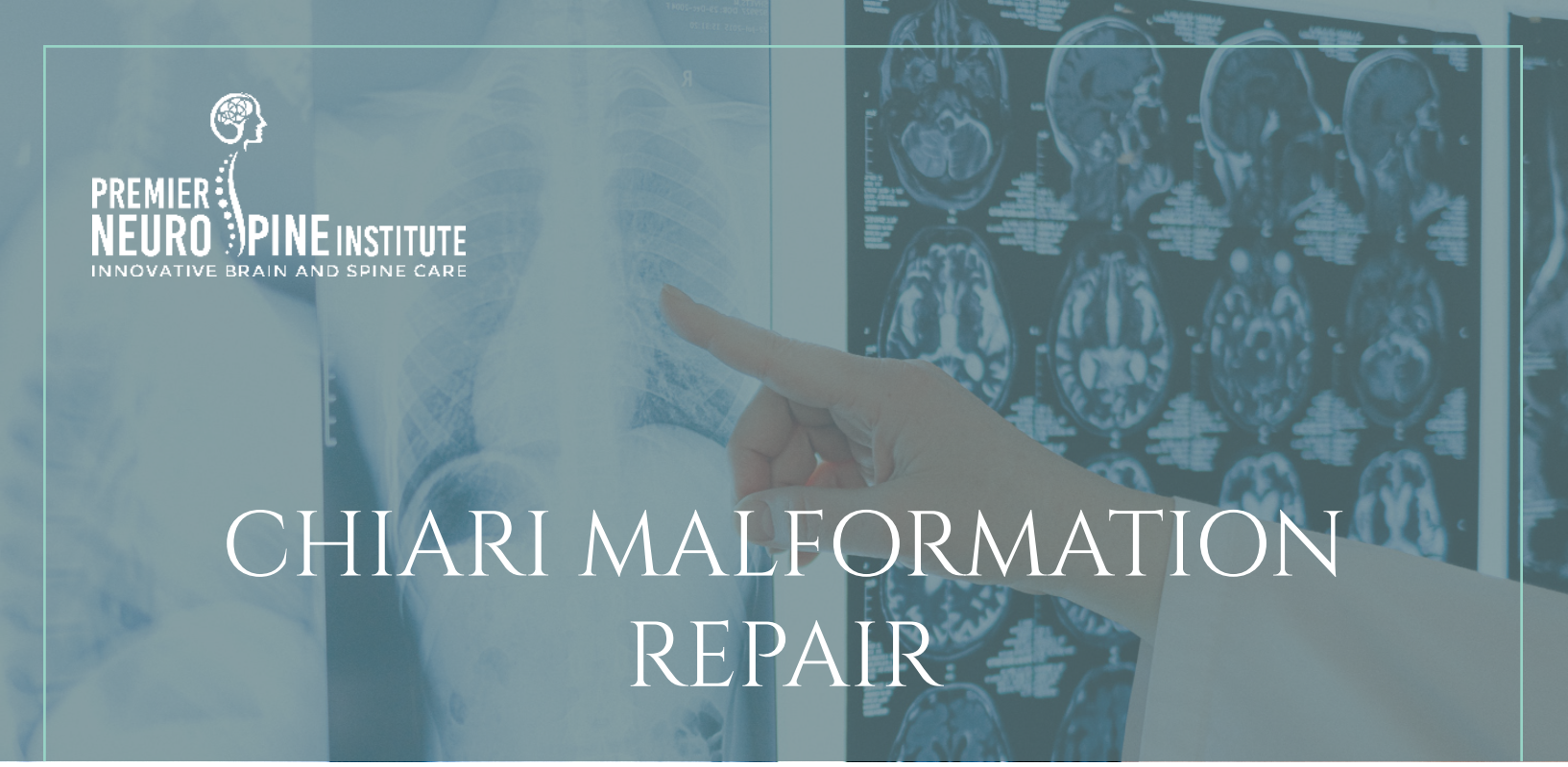
Some patients do have residual symptoms of the condition and if the existing injury to the spinal cord was permanent before the surgery, it cannot be reversed.

Symptoms of Chiari such as exertional headaches and pain in the neck tend to respond well to the procedure, as do symptoms associated with the brainstem such as numbness or pain in the face, tinnitus, problems with swallowing, dizziness and various eye problems.



What are the Risks of Chiari malformation Repair?

Risks with this procedure are uncommon. These can include bleeding around or in the surgical site as well as infection. Nerve damage, paralysis, stroke, CSF leakage, brain sag and hydrocephalus are also possibilities. Moreover, a bulge containing CSF may develop beneath the skin at the site of the incision in a condition called pseudomeningocele.



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Pre and post-procedure instructions

Pre-Procedure:

1. You will need to complete a medical clearance and/or lab work prior to surgery. Specific instructions will be given to you by our scheduling coordinator. You should get your lab work done PRIOR to your medical clearance appointment so your PCP can review the results during the appointment.

2. You must discontinue the following medication seven (7) days prior to surgery: Aspirin, Aspirin related products, NSAIDS such as Advil, Ibuprofen, Aleve, Feldane, Nuprin, Motrin, Celebrex, Darvon, Ecotrin, Endodan, Excedrin, Florinal, Norgesic, Orphengesic, Percodan, Pravigard, and Soma. These medications may be resumed as soon as possible when deemed safe by your surgeon.

3. YOU MUST discontinue ALL blood thinners such as: Plavix (Clopidogrel), Coumadin (Warfarin), Eliquis, Pradaxa, Brillinta, Fish Oil, Aggrenox, Vitamin K, Vitamin E, Vitamin B6 7 day prior to surgery. These medications may be resumed as soon as possible when deemed safe by your surgeon.

4. FOR WOMEN ONLY: Hold Estrogens (Cenestin, Estratest, Estropipate, Menest, Ortho-Est, Premarin, Premphase, Prempro etc.) on the day of surgery and resume when instructed by your physician.

5. Hold ALL herbal supplements including garlic, ginseng, and St. John's Wart 7 days before surgery.

6. Please discontinue any and all diet pills two (2) weeks prior to your surgical procedure.

7. DO NOT EAT OR DRINK ANYTHING AFTER MIDNIGHT THE DAY BEFORE YOUR SURGERY, AND NOTHING ON THE MORNING OF YOUR SURGERY, UNLESS OTHERWISE ADVISED BY YOUR PHYSICIAN. You may take essential medications, such as blood pressure medications with JUST a sip of water.

8. Please arrive at the surgery center about 1-2 hours prior to your anticipated start time. Typically, the surgery center will provide you with instructions on when to arrive and specific directions (1-2 days beforehand) on when to get there and what to bring. However, it is VERY important that you bring your most recent imaging with you (CT scan/MRI disk).

9. We highly encourage bringing a friend or a family member to the surgery center with you, so that we can explain the post-operative rules and instructions.

10. After your procedure, you will recover in the PACU where nursing staff will provide you with post-operative care and inform you of how the procedure went.

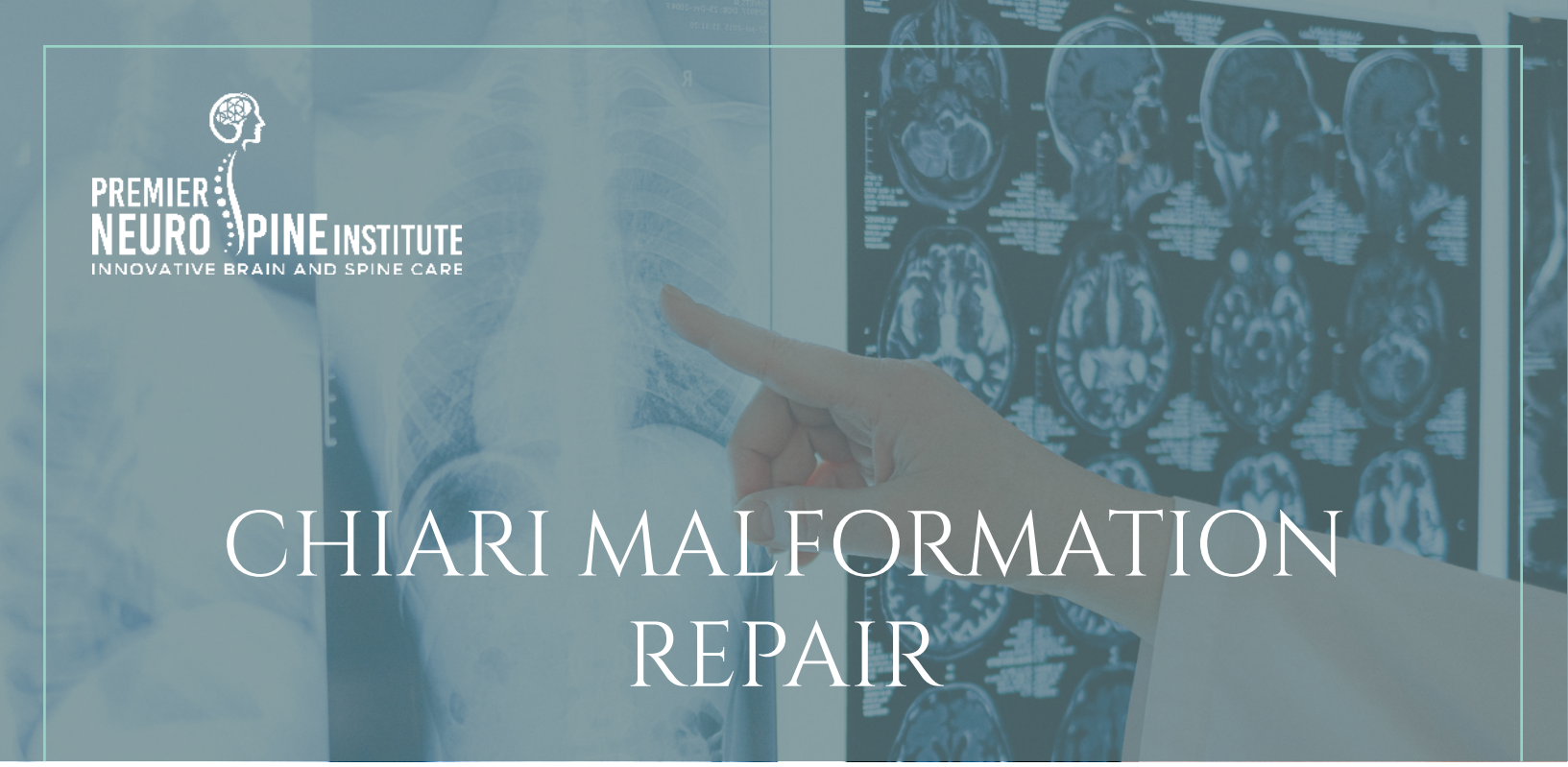
11. If you are prescribed opiate pain medication by another physician (such as pain management physician), MAKE SURE you see them prior to surgery so you are covered for post-surgical pain. Pharmacies will not fill prescriptions from another provider. If you do not take opiates at home, we will prescribe you with a 7-day course to cover your post operative pain.

12. After surgery, you will most likely require physical therapy. This has been proven to lead to optimal outcomes. If you have a preference of a physical therapist, please let your provider know prior to or during your post-operative appointment.

Post Procedure:

1. Refrain from strenuous activities and follow post-operative instructions.

2. Pain can increase in your treatment areas 2-5 days after your procedure. It may take up to 14 days for symptoms to improve. Symptoms may fluctuate during the healing process, which



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occurs over 4-8 weeks. You likely will not feel fully back to "normal" for about 3 months.

3. You may have some difficulty swallowing and a sore throat for several days after your procedure. This is very common and will typically go away on its own. If it does not go away or you have difficulty with breathing please, call the number provided below.

4. You should apply ice around places of discomfort for 20 minutes on and 20 minutes off. Please place a barrier between your skin and the ice. Heat is okay to apply to your back or neck muscles, just not over the incision site.

5. You may experience a low-grade fever after treatment. Call if your temperature is above 100.4.

6. No anti-inflammatory medication (Celebrex, Advil, Mobic, Motrin, Aleve) should be used for 10 days after surgery.

7. Light exercise or physical therapy is okay to start 2 weeks after treatment.

8. Pain medication prescriptions may say to take 2 tablets every 6 hours. If your instructions say this, JUST TAKE ONE tablet every 4-6 hours as needed for pain. WE DO NOT REFILL NARCOTIC PAIN MEDICATIONS AFTER SURGERY. If you continue to have pain, you will need to see a pain management doctor for narcotics.

9. If you were prescribed a brace, you must wear it when out of bed. If you are sleeping, sitting down, relaxing or eating, you may remove your brace. You will be in your brace between 4-6 weeks, depending on the type of surgery you had. If you had a cervical disc arthroplasty "replacement," you will only require a soft collar for two weeks.

10. Do not drive until you can stomp your feet on the ground and do not feel pain.

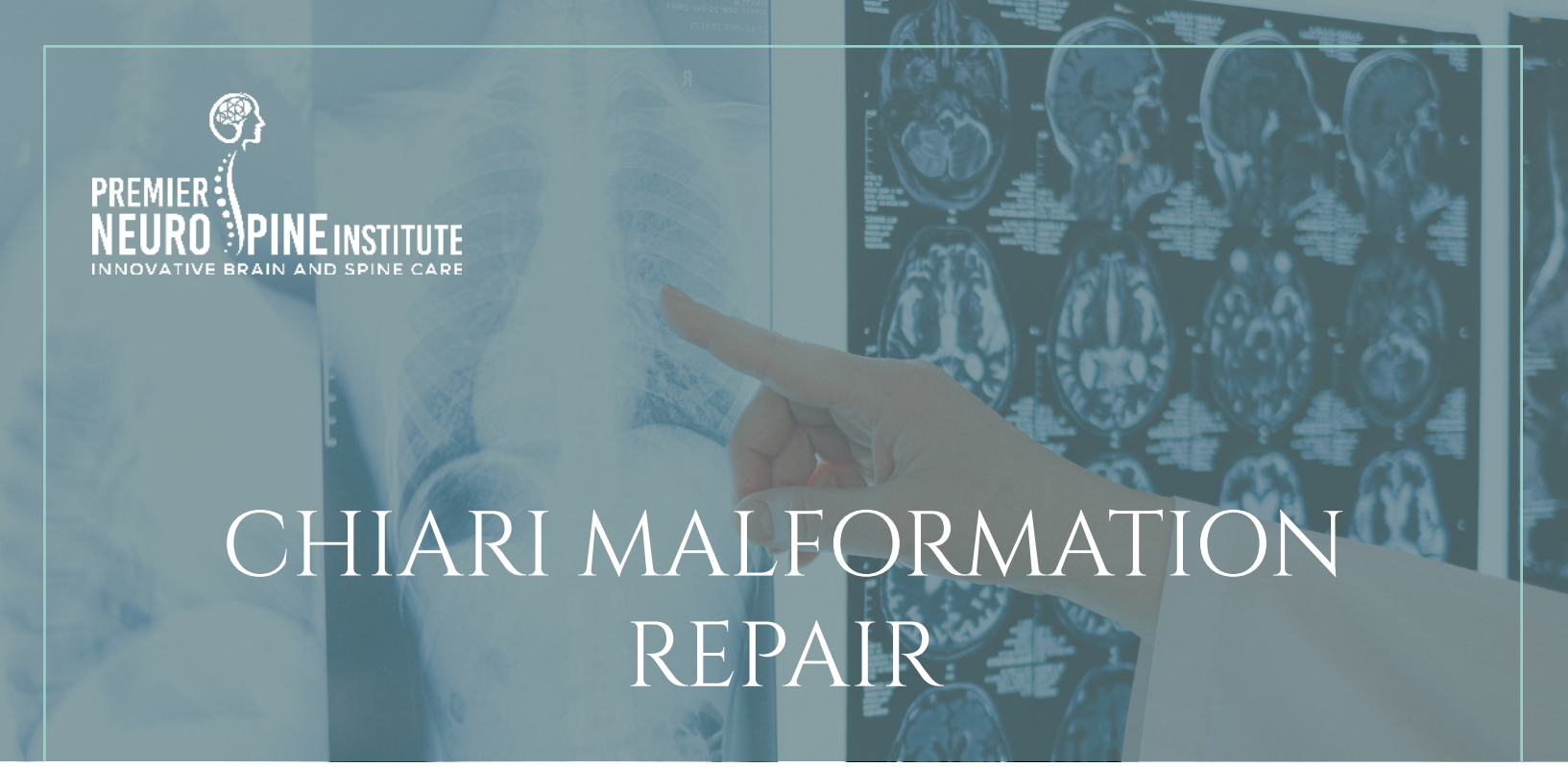
11. Wound care: You will have stitches buried underneath your skin. They will dissolve on their own. On top of the wound, you will have skin glue and steri strips (which look like little pieces of white tape). PLEASE INFORM PROVIDER PRIOR IF YOU HAVE ANY ALLERGIES TO SKIN GLUE OR ADHESIVE PRODUCTS. Do NOT remove or peel off steri-strips, these will fall off on their own. On top of the steri-strips, you will have gauze and tape. The gauze and tape is what you will be able to remove in 3 days. Do not wet the dressing at all in those 3 days. On day 3, you may remove the top layer of your dressing in the morning and shower as you normally would. DO NOT SUBMERGE wound in water for 3 weeks (bath tub, jacuzzi, beach, etc.).

12. Besides narcotic medication for pain, you may use Tylenol (acetaminophen) to optimize pain control. You may take up to 3,000 mg per day, unless contraindicated due to allergy or liver issues. Make note that some narcotics are mixed with Tylenol, (for example, Percocet has 325 mg of Tylenol per pill) so dose accordingly.

13. You may walk as long as you are stable. We do want you out of bed as much as possible unless otherwise instructed. NO BENDING, TWISTING, OR LIFTING OVER 10 LBS FOR 4 WEEKS.

14. You will need to follow up in the clinic for a post-operative evaluation in 4 weeks. Depending on your procedure, you may be required to have an X-ray done prior to the appointment. PLEASE BRING THE CD OF YOUR IMAGES. Your X-ray script will be given to you the day of your surgery. If you do not receive it or lose it, please call for a new script.

15. You may have a drain after surgery. Do not be alarmed. The reason we place these drains is because you may have been a little "oozy" after the procedure. We place them so the extra blood and fluid can drain out of your wound easily. They are typically removed the next day by your home healthcare nurse. If you do not have home healthcare set up, call the office for



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an appointment to remove the drain. For questions regarding surgical scheduling, please call Chris (Scheduling Coordinator) at 727-605-1770 (EXT 1003). For any post-operative questions or concerns, please call our office at 727-605-1770. Please note that you may be sent to voicemail. We will return your call as soon as possible. If it is an emergency, please call 911. If you are calling after hours, please leave a voicemail in the general inbox and it will be forwarded to the medical team.

O: 727.605.1770

F: 727.605.1080

scheduling@premierneurosurgery.com