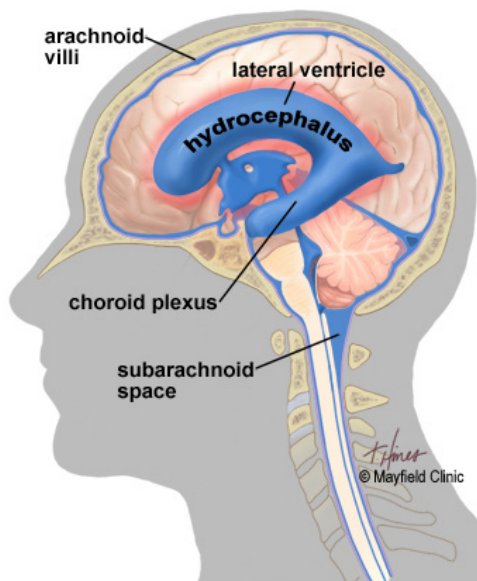


VENTRICULOPERITONEAL SHUNT PLACEMENT

CANDIDATES FOR A VENTRICULOPERITONEAL SHUNT PLACEMENT

Placing a Ventriculoperitoneal Shunt is a surgical procedure that treats hydrocephalus, which is a condition that occurs when excess cerebrospinal fluid builds up in the ventricles of the brain. Cerebrospinal fluid acts as a cushion between the brain and the skull and delivers vital nutrients to the brain while also washing away waste. The fluid flows through the ventricles to the brain stem, cleansing the brain and spinal cord before it is reabsorbed into the blood.

When cerebrospinal fluid collects in the ventricles, it disrupts the flow and creates pressure within the skull that presses against the brain. This pressure can be harmful to the brain tissue. A surgeon will perform a Ventriculoperitoneal Shunt Placement to surgically place a shunt within the ventricle, diverting the cerebrospinal fluid away from the brain and restoring its normal flow.



WHAT IS A VENTRICULOPERITONEAL SHUNT PLACEMENT?

During a Ventriculoperitoneal Shunt Placement procedure, the surgeon places a medical device called a shunt, which is a small hole or passage, in the ventricle to relieve pressure caused by fluid build-up. A ventriculoperitoneal shunt is used to treat hydrocephalus wherein cerebrospinal fluid builds up in the ventricles, expanding the affected area and causing damage that may lead to symptoms of mild dementia, cognitive delays, shuffled gait or incontinence.

The patient is placed under general anesthesia for the procedure, which usually takes around 90 minutes. The area behind the patient's ear is shaved prior to surgery so that the surgeon may place the catheter here. Then, a small incision is made behind the ear and the surgeon drills a small hole in the skull. The catheter, which is a small plastic tube that will drain the excess cerebrospinal fluid, is placed through this hole and into the brain. Another catheter is threaded under the patient's skin behind the ear, traveling down to the chest and abdomen. Excess fluid will be deposited here, where it can be absorbed into the body.

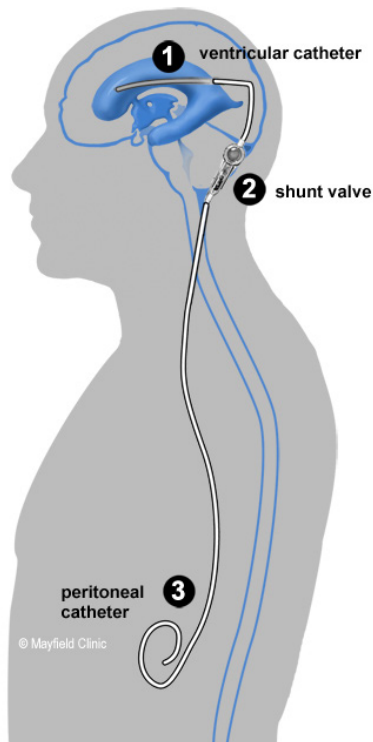
A pump may also be attached to both catheters, which will activate when pressure builds up in the skull and work to drain the excess fluid. Some pumps or valves can also be programmed to activate at a certain level of fluid build-up.

RESULTS OF A VENTRICULOPERITONEAL SHUNT PLACEMENT PROCEDURE

The shunt will remain in the patient and the surgeon and medical staff will ensure it is working properly before the patient is discharged. The recovery period from a Ventriculoperitoneal Shunt Placement is typically three to four days and most patients are able to leave the hospital within a week of the surgery. Before being discharged, the patient's heart rate and blood pressure are monitored and

proper function of the shunt is confirmed. Preventative antibiotics are administered to ward off infection from surgery.

Shunting is generally an effective treatment of hydrocephalus and is successful in draining excess cerebrospinal fluid to reduce pressure within the skull. The shunt may require replacement after several years and should be monitored frequently.



WHAT ARE THE RISKS OF A VENTRICULOPERITONEAL SHUNT PLACEMENT?

As with any surgical procedure, risks include excessive bleeding, infection, adverse reaction to anesthesia, changes in heart rate, blood pressure or difficulty breathing. Risks specific to a

Ventriculoperitoneal Shunt Placement are infection in the shunt or brain, blood clots, brain bleeds, damage to brain tissue or swelling of the brain. The shunt could also be ineffective in treating the patient's symptoms or may malfunction.

If the shunt does malfunction, complications could include over or under-draining of the cerebrospinal fluid. This could cause the ventricles to collapse and is a serious risk that may lead to headaches or hemorrhaging in the brain.

Fever, headache, abdominal pain, fatigue and a spike in blood pressure could indicate an infection. An infection is reportedly most common within the first few weeks following a Ventriculoperitoneal Shunt Placement.

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, Feldene, 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, Brilinta, 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 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 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.

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