A craniotomy is a type of brain surgery. During this surgery, a piece of bone is removed from the skull to give access to the brain. After the surgery is done, the piece of bone is replaced and the skin is closed.

A craniotomy may be done to treat:
- Brain tumors
- Bleeding or blood clots from a head injury
- An aneurysm, a weakness in a blood vessel or abnormal blood vessels
- Damage to the tissue that covers the brain
- Infections in the brain
- Severe nerve or facial pain
- Skull fractures
- Pressure in the brain after an injury or stroke
- Epilepsy, a brain disorder that causes seizures
- Certain brain diseases such as Parkinson’s disease to implant an electronic device

If the bone is not replaced right away, the surgery is known as a craniectomy. This is done to relieve pressure on the brain or to give the brain space to swell after stroke, brain injury or surgery.

The doctor will decide when the bone should be replaced. This is often 6 to 12 weeks after surgery. A helmet may need to be worn to protect the soft spot area on the head until the bone is replaced.

**Before surgery**
- You may be scheduled for a CT scan or MRI before your surgery. You may also have other tests such as an electrocardiogram (EKG), chest x-ray, blood work done before surgery. These tests will help your doctor plan for your surgery.
- You will be called the day before your surgery with the time of your surgery and where to check in when you get to the hospital.
- Your doctor may give you special diet guidelines to follow before surgery.
- **Do not eat or drink after midnight the night before your surgery.**
- Your doctor will talk with you about which medicines are okay to take before surgery.
Day of your surgery

- Your family can stay with you until you go to the Pre-Operative Holding Area.
- A doctor will talk to you and your family about the type of anesthesia used during surgery. The type used will depend on the type of surgery and whether your doctor needs you to be awake to follow certain commands during surgery.
- A nurse will talk with you and ask questions about your health and the surgery. You will also be asked to not wear or remove the following items the day of surgery:
  - Nail polish
  - Make-up
  - Jewelry
  - Hair clips
  - Dentures or partial plates
  - Contact lenses or eyeglasses
  - Hearing aids
- Your vital signs (blood pressure, pulse, temperature and breathing rate) will be taken at this time. Blood tests will be done, if needed. An IV (intravenous) catheter will be put into a vein to give you fluids.

During surgery

- The operating room staff will wear special scrub clothes, caps and masks. The room has bright lights and is cool. There is special equipment and tables set up with supplies and instruments. The staff will explain what will happen before you are put to sleep.
- A nurse will check your identification (ID) bracelet. You will be asked about any allergies. Then you will be made comfortable on the operating room table.
- Your vital signs will be watched closely. You will be hooked up to a heart monitor to watch your heart rate and rhythm.
- A small clip (pulse oximeter) will be put on your finger to measure your pulse and the amount of oxygen in your blood.
- Many tubes and IV lines are placed right before surgery. These are used to monitor you during and after surgery. As you recover, the tubes and lines will be removed. Some of this equipment may include:
  - **Heart monitor**: Used to check your heart rate and rhythm.
  - **Endotracheal tube (ET tube)**: After you are asleep, an ET tube is placed through the mouth or nose and passed down into your trachea (windpipe). This breathing tube is connected to a machine called a ventilator to help you breathe. The ET tube is removed when you wake up and able to breathe on your own.
• **Intracranial pressure (ICP) monitor**: Used to measure the pressure in the brain. Swelling can cause pressure to rise and may cause more injury to the brain tissue. The pressure is often measured using a device called an external ventricular drain (EVD). The EVD is also used to remove fluid from the brain to help control the pressure.

• **Nasogastric (NG) tube**: This tube is placed through the nose and passes into the stomach. It is used to empty the stomach to prevent nausea.

• **Intravenous line (IV)**: A small catheter (tube) is put into a vein and used to give medicines and fluids. An IV may be put in an arm vein or sometimes an IV is put into a large vein in the chest or neck. This is called a Central Venous Catheter (CVC).

• **Arterial lines (A-line)**: A small catheter like an IV goes into an artery to measure your blood pressure. The wrist, foot or groin area is most common place to put the line. Blood can be removed from this line for tests.

• **Foley catheter**: This tube is placed into the bladder. It drains urine into a drain bag.

• **Sequential Compression Device (SCD)**: These are soft plastic sleeves that wrap around each leg. They inflate and deflate to help circulate blood in the legs to prevent blood clots.

### What happens during the procedure:

- Hair on part of your scalp is shaved. The scalp is cleaned for surgery.

- An incision is made in the scalp. The scalp is pulled back and small holes are made in the skull. A piece of skull is removed.

- The surgeon works through the opening in the skull to treat the problem.

- The piece of bone is usually replaced after surgery. It is secured using small metal plates, sutures, or wires.

- The scalp is closed with stitches or staples.

### Risks from this surgery

There are risks for any type of surgery. Your doctor will go over the risks with you before your surgery.
After surgery

You will go to the Neuroscience Critical Care Unit. A nurse will watch you closely and check your vital signs and tubes and drains often. You will also have frequent checks of your brain and nerves. You will be asked to do the following:

• Open your eyes.
• Squeeze the nurse’s hands.
• Answer questions such as: What is your name? Where are you? What day is it?
• Hold your arms up in the air.
• Lift your legs off of the bed and wiggle your toes.

When you first wake up, you may feel cold and you may shiver. This is normal. Extra blankets and warm lights will be used to warm you. Your family members will be allowed to visit after you wake up.

Family waiting area

Family and caregivers can wait in a nearby waiting room during your surgery. Craniotomy often takes 3 to 5 hours, or longer, to complete. If possible, be sure someone is always in the waiting room to receive any news. The doctor will come talk with family as soon as your surgery is done. Family and caregivers will also be told what the visiting hours are for the Neuroscience Critical Care Unit (NCCU).

Care in the Neuroscience Critical Care Unit

• Deep breathing exercises:
  After the ET tube (breathing tube) is removed, your nurse will teach you how to do deep breathing exercises with a small device called an incentive spirometer. This helps to keep your lungs clear from infection after surgery.

• IV fluids:
  You may have a couple IV’s in place after surgery. One IV may be in your arm or hand and the other may be in a vein in your chest or neck (CVC). These will be used to give you fluids and medicines. When you are able to eat and drink, the IVs will be removed.

• Nutrition:
  You will not be able to eat or drink anything after surgery or while the ET tube is in place. After the tube is removed, your ability to swallow safely will be checked. If it is safe, you will be able to have ice chips. Your nurse will listen to your stomach for bowel sounds and ask if you are passing gas. These are signs that your body is ready for food. You will be started on clear liquids and then solid foods after your intestines start moving.
• **Activity:**
   While in bed, you will be helped to turn from side to side often. Lying in one position for longer than 1 to 2 hours may slow your recovery. You will be helped out of bed and into a chair the day after your surgery. The nurse will help you get up out of bed. If needed, physical and occupational therapists are available to help you.

• **Your incision:**
   The surgeon may use stitches or staples to close your incision. The incision is covered with a tight dressing. This will be removed on the first or second day after surgery. You may have a small dressing placed over the incision, or it may be left uncovered. It is important to keep this area clean and dry to lower the risk of infection. The stitches or staples will be removed about 10 to 14 days after surgery.
   If you have a drain in place, it will be removed when the pressure in your brain is controlled without having to drain extra fluid.

• **Pain control and healing:**
   It is normal for your incision to feel itchy, painful, burning or numbness. You may also have headaches. Your nurse will ask you about your pain. Pain medicine will be given through your IV or by a shot until you can take pills by mouth. Ask for pain medicine when you need it. You should be comfortable enough to move, cough and deep breathe, eat and get out of bed.
   As your wound heals, you may hear a clicking sound where the bone is re-attaching. It may take 6 to 12 months for the bone to fully heal. You may notice that you have less energy when you get home. This may last for several months.

• **Feelings about your surgery:**
   Surgery can be an emotional and stressful time for you, your family and caregivers. Let your doctor or nurse know if you have any question or concerns. They can help answer your questions and help you find the resources you may need. A chaplain and social worker are also available to help as needed.

• **Hospital stay:**
   You may be in the hospital for about 3 to 7 days or longer. This depends on the type of surgery you had and how you recover. You may have a rehabilitation evaluation to see if more time is needed to recover before you leave the hospital.

• **Discharge planning:**
   A case manager or patient care resource manager (PCRM) and a social worker will help you and your caregiver with planning to leave the hospital. Information on how to care for yourself at home and your medicines will be explained to you before you leave.
When to call the doctor
Call your doctor if you have any of these problems:

- Nausea and vomiting that keeps you from eating or drinking
- New weakness or swelling in your arms or legs
- Feel fluid drip from your nose or ears
- Change in the amount, color or odor of the drainage from the incision
- Skin around the incision becomes red, warm, swollen or tender
- Fever greater than 100.5 degrees Fahrenheit or 38 degrees Celsius
- Incision pulls apart or opens up
- Headache pain or other pain that increases or is not relieved with medicine

When to go to the Emergency Department
Go to the nearest emergency department or call 911 right away for any of the following:

- Any change in alertness; fell more sleepy than usual or feel restless or confused
- Breathing problems
- Chest pain
- Vision problems or a change in vision

Talk to your doctor or health care team if you have any questions about your care.

For more health information, contact the Library for Health Information at 614-293-3707 or e-mail health-info@osu.edu.

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