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# Brain surgery

Brain surgery is an operation to treat problems in the brain and surrounding structures.

## Description

You may be awake or asleep during this procedure which is called a craniotomy. An awake craniotomy is done when your surgeon works near critical areas of your brain, such as the language area.

Before surgery, the hair on part of the scalp is shaved and the skin is cleaned. The surgeon makes a cut through the scalp to expose the bone (skull). The location of this cut depends on where the problem in the brain is located.

The surgeon uses a high-speed drill and saw to cut a portion of the bone (a bone flap) to access the brain.

In some cases, the surgeon may create a smaller incision and use a tube equipped with a light and camera, known as an endoscope. The surgery is done by inserting tools through the endoscope. A computerized navigation system that generates 3D images from an MRI or CT scan of your brain helps the surgeon locate the specific area to be operated on.

During surgery, your surgeon may:

- Clip off an aneurysm to prevent bleeding
- Remove abnormal blood vessels
- Remove a tumor or a piece of tumor for a biopsy
- Remove abnormal brain tissue
- Drain blood or an infection
- Free a nerve
- Take a sample of brain tissue to help diagnose nervous system diseases
- Put a tube (shunt) in the cavities of your brain to remove excess fluid

The bone flap is usually placed back at the end of the surgery, using small titanium plates to hold it in place. These plates are MRI compatible. This brain surgery is called a craniotomy.

If a smaller hole (burr hole) was made, your surgeon may cover it with a metal plate.

The bone flap may not be put back if your surgery involved a tumor or an infection, or if the brain was swollen. This brain surgery is called a craniectomy. The bone flap may be kept in a freezer or placed under the skin of your abdomen and put back during a future operation.

The time it takes for the surgery depends on the problem being treated.

## Why the Procedure is Performed

Brain surgery may be done if you have:

- Brain tumor
- Bleeding (hemorrhage) in the brain
- Blood clots (hematomas) in the brain
- Weaknesses in blood vessels (brain aneurysm repair)
- Abnormal blood vessels in the brain (arteriovenous malformations [AVMs], cavernous malformation)
- Damage to tissues covering the brain (dura)
- Infections in the brain (brain abscesses)
- Severe nerve or face pain (such as trigeminal neuralgia, or tic douloureux)
- Skull fracture
- Pressure in the brain after an injury or stroke
- Epilepsy
- Certain brain diseases (such as Parkinson disease) that may be helped with an implanted electronic device
- Excess cerebrospinal fluid in the cavities of your brain (hydrocephalus)

## Risks

Risks for anesthesia and surgery in general are:

- Reactions to medicines
- Problems breathing
- Bleeding, blood clots, infection

Possible risks of brain surgery are:

- Problems with speech, memory, muscle weakness, balance, vision, coordination, and other functions. These problems may last a short while or they may not go away.
- Blood clot or bleeding in the brain.
- Seizures.
- Stroke.
- Coma.
- Infection in the brain, wound, or skull.
- Brain swelling.

- The need for more surgery.

## Before the Procedure

Your surgeon will examine you and may order lab and imaging tests.

Tell your surgeon or nurse if:

- You are or could be pregnant
- You are taking any medicines, including medicines, drugs, supplements, or herbs you bought without a prescription

During the week before your surgery:

- You may be asked to temporarily stop taking medicines that keep your blood from clotting. These medicines are called blood thinners. This includes over-the-counter medicines and supplements such as aspirin, ibuprofen (Advil, Motrin), naproxen (Aleve, Naprosyn), and vitamin E. Many prescription medicines are also blood thinners.
- Ask your surgeon which medicines you should still take on the day of surgery.
- Try to stop smoking. Smoking can slow healing after your operation. Ask your surgeon for help.
- Your surgeon or nurse may ask you to wash your hair with special shampoo the night before surgery.

On the day of surgery:

- Follow instructions about when to stop eating and drinking.
- Take the medicines your surgeon told you to take with a small sip of water.
- Arrive at the hospital on time.

## After the Procedure

After surgery, you will be closely monitored by your health care team to make sure your brain is working properly. The surgeon or nurse may ask you questions, shine a light in your eyes, and ask you to do simple tasks. You may need oxygen for a few days.

The head of your bed will be kept raised to help reduce swelling of your face or head. The swelling is normal after surgery.

You'll be given medicines to relieve pain.

You'll usually stay in the hospital for 3 to 7 days. You may need physical therapy (rehabilitation).

After you go home, follow any self-care instructions you're given.

## Outlook (Prognosis)

How well you do after brain surgery depends on the condition being treated, your general health, which part of the brain is involved, and the specific type of surgery.

## Alternative Names

Craniotomy; Surgery - brain; Neurosurgery; Craniectomy; Stereotactic craniotomy; Stereotactic brain biopsy; Endoscopic craniotomy

## References


Patterson JT. Neurosurgery. In: Townsend CM Jr, Beauchamp RD, Evers BM, Mattox KL, eds. *Sabiston Textbook of Surgery*. 21st ed. St Louis, MO: Elsevier; 2022:chap 68.

Tate MC, Duffau H. Awake craniotomy and intraoperative mapping. In: Winn HR, ed. *Youmans and Winn Neurological Surgery*. 8th ed. Philadelphia, PA: Elsevier; 2023:chap 156.

Zada G, Attenello FJ, Pham M, Weiss MH. Surgical planning: an overview. In: Winn HR, ed. *Youmans and Winn Neurological Surgery*. 8th ed. Philadelphia, PA: Elsevier; 2023:chap 18.


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