

Pituitary tumor

Signs and symptoms of a non-functioning pituitary tumor

Sometimes, a pituitary tumor may press on or damage parts of the pituitary gland, causing it to stop making one or more hormones. Too little of a certain hormone will affect the work of the gland or organ that the hormone controls. The following symptoms may occur:

- Headache.
- Some loss of vision.
- Loss of body hair.
- In women, less frequent or no menstrual periods or no milk from the breasts.
- In men, loss of facial hair, growth of breast tissue, and impotence.
- In women and men, lower sex drive.
- In children, slowed growth and sexual development.

Most of the tumors that make LH and FSH do not make enough extra hormones to cause symptoms. These tumors are considered to be non-functioning tumors.

Signs and symptoms of a functioning pituitary tumor

When a functioning pituitary tumor makes extra hormones, the symptoms will depend on the type of hormone being made.

Too much prolactin may cause:

- Headache.
- Some loss of vision.
- Less frequent or no menstrual periods or menstrual periods with a very light flow.
- Trouble becoming pregnant or an inability to become pregnant.
- Impotence in men.

- Lower sex drive.
- Flow of breast milk in a woman who is not pregnant or breast-feeding.

Too much ACTH may cause:

- Headache.
- Some loss of vision.
- Weight gain in the face, neck, and trunk of the body, and thin arms and legs.
- A lump of fat on the back of the neck.
- Thin skin that may have purple or pink stretch marks on the chest or abdomen.
- Easy bruising.
- Growth of fine hair on the face, upper back, or arms.
- Bones that break easily.
- Anxiety, irritability, and depression.

Too much growth hormone may cause:

- Headache.
- Some loss of vision.
- In adults, acromegaly (growth of the bones in the face, hands, and feet). In children, the whole body may grow much taller and larger than normal.
- Tingling or numbness in the hands and fingers.
- Snoring or pauses in breathing during sleep.
- Joint pain.
- Sweating more than usual.
- Dismorphophobia (extreme dislike of or concern about one or more parts of the body).

Too much thyroid-stimulating hormone may cause:

- Irregular heartbeat.
- Shakiness.
- Weight loss.

- Trouble sleeping.
- Frequent bowel movements.
- Sweating.

Other general signs and symptoms of pituitary tumors:

- Nausea and vomiting.
- Confusion.
- Dizziness.
- Seizures.
- Runny or ‘drippy’ nose (cerebrospinal fluid that surrounds the brain and spinal cord leaks into the nose).

Imaging studies and tests that examine the blood and urine are used to detect (find) and diagnose a pituitary tumor.

The following tests and procedures may be used:

- Physical exam and history: An exam of the body to check general signs of health, including checking for signs of disease, such as lumps or anything else that seems unusual. A history of the patient’s health habits and past illnesses and treatments will also be taken.
- Eye exam: An exam to check vision and the general health of the eyes.
- Visual field exam: An exam to check a person’s field of visions (the total area in which objects can be seen). This test measures both central vision (how much a person can see when looking straight ahead) and peripheral vision (how much a person can see in all other directions while staring straight ahead). The eyes are tested one at a time. The eye not being tested is covered.
- Neurological exam: A series of questions and tests to check the brain, spinal cord, and nerve function. The exam checks a person’s mental status, coordination, and ability to walk normally, and how well the muscles, senses, and reflexes work. This may also be called a neuro exam or a neurologic exam.

- MRI (magnetic resonance imaging) with gadolinium: A procedure that uses a magnet, radio waves, and a computer to make a series of detailed pictures of areas inside the brain and spinal cord. A substance called gadolinium is injected into a vein. The gadolinium collects around the cancer cells so they show up brighter in the picture. This procedure is also called nuclear magnetic resonance imaging (NMRI).
- CT scan (CAT scan): A procedure that makes a series of detailed pictures of areas inside the brain, taken from different angles. The pictures are made by a computer linked to an x-ray machine. A dye may be injected into a vein or swallowed to help the organs or tissues show up more clearly. This procedure is also called computed tomography, computerized tomography, or computerized axial tomography.
- Blood chemistry study: A procedure in which a blood sample is checked to measure the amounts of certain substances, such as hormones, released into the blood by organs and tissues in the body. An unusual (higher or lower than normal) amount of a substance can be a sign of disease in the organ or tissue that makes it.
- Blood tests: Tests to measure the levels of testosterone or estrogen in the blood. A higher or lower than normal amount of these hormones may be a sign of pituitary tumor.
- Twenty-four-hour urine test: A test in which urine is collected for 24 hours to measure the amounts of certain substances. An unusual (higher or lower than normal) amount of a substance can be a sign of disease in the organ or tissue that makes it. A higher than normal amount of the hormone cortisol may be a sign of a pituitary tumor.
- High-dose dexamethasone suppression test: A test in which one or more high doses of dexamethasone are given. The level of cortisol is checked from a sample of blood or from urine that is collected for three days.
- Low-dose dexamethasone suppression test: A test in which one or more small doses of dexamethasone are given. The level of

- cortisol is checked from a sample of blood or from urine that is collected for three days.
- Venous sampling for pituitary tumors: A procedure in which a sample of blood is taken from veins coming from the pituitary gland. The sample is checked to measure the amount of ACTH released into the blood by the gland. Venous sampling may be done if blood tests show there is a tumor making ACTH, but the pituitary gland looks normal in the imaging tests.
 - Biopsy: The removal of cells or tissues so they can be viewed under a microscope by a pathologist to check for signs of cancer.
 - Immunohistochemistry study: A laboratory test in which a substance such as an antibody, dye, or radioisotope is added to a sample of cancer tissue to test for certain antigens. This type of study is used to tell the difference between different types of cancer.
 - Immunocytochemistry study: A laboratory test in which a substance such as an antibody, dye, or radioisotope is added to a sample of cancer cells to test for certain antigens. This type of study is used to tell the difference between different types of cancer.
 - Light and electron microscopy: A laboratory test in which cells in a sample of tissue are viewed under regular and high-powered microscopes to look for certain changes in the cells.

Certain factors affect prognosis (chance of recovery) and treatment options.

The prognosis (chance of recovery) depends on the type of tumor and whether the tumor has spread into other areas of the central nervous system (brain and spinal cord) or outside of the central nervous system to other parts of the body.

Treatment options depend on the following:

- The type and size of the tumor.

- Whether the tumor is making hormones.
- Whether the tumor is causing problems with vision or other symptoms.
- Whether the tumor has spread into the brain around the pituitary gland or to other parts of the body.
- Whether the tumor has just been diagnosed or has recurred (come back).

Stages of Pituitary Tumors

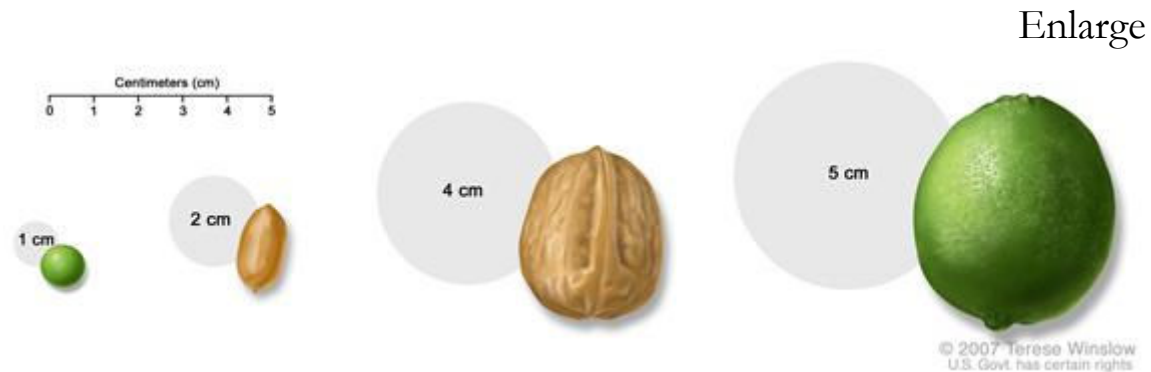
- Once a pituitary tumor has been diagnosed, tests are done to find out if it has spread within the central nervous system (brain and spinal cord) or to other parts of the body.
- Pituitary tumors are described in several ways.

Once a pituitary tumor has been diagnosed, tests are done to find out if it has spread within the central nervous system (brain and spinal cord) or to other parts of the body.

The extent or spread of cancer is usually described as stages. There is no standard staging system for pituitary tumors. Once a pituitary tumor is found, tests are done to find out if the tumor has spread into the brain or to other parts of the body. The following tests and procedures may be used:

- MRI (magnetic resonance imaging): A procedure that uses a magnet, radio waves, and a computer to make a series of detailed pictures of areas inside the body. This procedure is also called nuclear magnetic resonance imaging (NMRI).
- CT scan (CAT scan): A procedure that makes a series of detailed pictures of areas inside the body, taken from different angles. The pictures are made by a computer linked to an x-ray machine. A dye may be injected into a vein or swallowed to help the organs or tissues show up more clearly. This procedure is also called computed tomography, computerized tomography, or computerized axial tomography.

Pituitary tumors are described in several ways.



Pea, peanut, walnut, and lime show tumor sizes.

Pituitary tumors are described by their size and grade, whether or not they make extra hormones, and whether the tumor has spread to other parts of the body.

The following sizes are used:

- Microadenoma: The tumor is smaller than 1 centimeter.
- Macroadenoma: The tumor is 1 centimeter or larger.

Most pituitary adenomas are microadenomas.

The grade of a pituitary tumor is based on how far it has grown into the surrounding area of the brain, including the sella (the bone at the base of the skull, where the pituitary gland sits).

Recurrent Pituitary Tumors

A recurrent pituitary tumor is cancer that has recurred (come back) after it has been treated. The cancer may come back in the pituitary gland or in other parts of the body.

Treatment Option Overview

Key Points for This Section

- There are different types of treatment for patients with pituitary tumors.
- Four types of standard treatment are used:
 - Surgery
 - Radiation therapy
 - Drug therapy
 - Chemotherapy
- New types of treatment are being tested in clinical trials.
- Patients may want to think about taking part in a clinical trial.
- Patients can enter clinical trials before, during, or after starting their cancer treatment.
- Follow-up tests may be needed.

There are different types of treatment for patients with pituitary tumors.

Different types of treatments are available for patients with pituitary tumors. Some treatments are standard (the currently used treatment), and some are being tested in clinical trials. A treatment clinical trial is a research study meant to help improve current treatments or obtain information on new treatments for patients with cancer. When clinical trials show that a new treatment is better than the standard treatment, the new treatment may become the standard treatment. Patients may want to think about taking part in a clinical trial. Some clinical trials are open only to patients who have not started treatment.

Four types of standard treatment are used:

Surgery

Many pituitary tumors can be removed by surgery using one of the following operations:

- **Transsphenoidal surgery:** A type of surgery in which the instruments are inserted into part of the brain by going through an incision (cut) made under the upper lip or at the bottom of the nose between the nostrils and then through the sphenoid bone (a butterfly-shaped bone at the base of the skull) to reach the pituitary gland. The pituitary gland lies just above the sphenoid bone.
- **Endoscopic trans-sphenoidal surgery:** A type of surgery in which an endoscope is inserted through an incision (cut) made at the back of the inside of the nose and then through the sphenoid bone to reach the pituitary gland. An endoscope is a thin, tube-like instrument with a light, a lens for viewing, and a tool for removing tumor tissue.
- **Craniotomy:** Surgery to remove the tumor through an opening made in the skull.

Even if the doctor removes all the cancer that can be seen at the time of the surgery, some patients may be given chemotherapy or radiation therapy after surgery to kill any cancer cells that are left. Treatment given after the surgery, to lower the risk that the cancer will come back, is called adjuvant therapy.

Radiation therapy

Radiation therapy is a cancer treatment that uses high-energy x-rays or other types of radiation to kill cancer cells or keep them from growing. There are two types of radiation therapy. External radiation therapy uses a machine outside the body to send radiation toward the cancer. Internal radiation therapy uses a radioactive substance sealed in needles, seeds, wires, or catheters that are placed directly into or near the cancer.

Stereotactic radiation surgery uses a rigid head frame attached to the skull to aim a single large dose of radiation directly to a tumor,

causing less damage to nearby healthy tissue. It is also called stereotaxic radiosurgery, radiosurgery, and radiation surgery. This procedure does not involve surgery.

The way the radiation therapy is given depends on the type of the cancer being treated.

Drug therapy

Drugs may be given to stop a functioning pituitary tumor from making too many hormones.

Chemotherapy

Chemotherapy may be used as palliative treatment for pituitary carcinomas, to relieve symptoms and improve the patient's quality of life. Chemotherapy uses drugs to stop the growth of cancer cells, either by killing the cells or by stopping them from dividing. When chemotherapy is taken by mouth or injected into a vein or muscle, the drugs enter the bloodstream and can reach cancer cells throughout the body (systemic chemotherapy). When chemotherapy is placed directly into the spinal column, an organ, or a body cavity such as the abdomen, the drugs mainly affect cancer cells in those areas (regional chemotherapy). The way the chemotherapy is given depends on the type of the cancer being treated.

Follow-up tests may be needed.

Some of the tests that were done to diagnose the cancer or to find out the stage of the cancer may be repeated. Some tests will be repeated in order to see how well the treatment is working. Decisions about whether to continue, change, or stop treatment may be based on the results of these tests. This is sometimes called re-staging.

Some of the tests will continue to be done from time to time after treatment has ended. The results of these tests can show if your

condition has changed or if the cancer has recurred (come back). These tests are sometimes called follow-up tests or check-ups.

Treatment Options for Pituitary Tumors

A link to a list of current clinical trials is included for each treatment section. For some types or stages of cancer, there may not be any trials listed. Check with your doctor for clinical trials that are not listed here but may be right for you.

Non-functioning Pituitary Tumors

Treatment may include the following:

- Surgery (transsphenoidal surgery, if possible) to remove the tumor, followed by watchful waiting (closely monitoring a patient's condition without giving any treatment until symptoms appear or change). Radiation therapy is given if the tumor comes back.
- Radiation therapy alone.

Treatment for luteinizing hormone -producing and follicle-stimulating hormone-producing tumors is usually transsphenoidal surgery to remove the tumor.

Prolactin-Producing Pituitary Tumors

Treatment may include the following:

- Drug therapy to stop the tumor from making prolactin and to stop the tumor from growing.
- Surgery to remove the tumor (transsphenoidal surgery or craniotomy) when the tumor does not respond to drug therapy or when the patient cannot take the drug.
- Radiation therapy.
- Surgery followed by radiation therapy.

ACTH-Producing Pituitary Tumors

Treatment may include the following:

- Surgery (usually trans-sphenoidal surgery) to remove the tumor, with or without radiation therapy.
- Radiation therapy alone.
- Drug therapy to stop the tumor from making ACTH.
- A clinical trial of stereo tactic radiation surgery.

Growth Hormone–Producing Pituitary Tumors

Treatment may include the following:

- Surgery (usually transsphenoidal or endoscopic transsphenoidal surgery) to remove the tumor, with or without radiation therapy.
- Drug therapy to stop the tumor from making growth hormone.

Thyroid-Stimulating Hormone–Producing Tumors

Treatment may include the following:

- Surgery (usually transsphenoidal surgery) to remove the tumor, with or without radiation therapy.
- Drug therapy to stop the tumor from making hormones.

Pituitary Carcinomas

Treatment of pituitary carcinomas is palliative, to relieve symptoms and improve the quality of life. Treatment may include the following:

- Surgery (trans sphenoidal surgery or craniotomy) to remove the cancer, with or without radiation therapy.
- Drug therapy to stop the tumor from making hormones.
- Chemotherapy.

Recurrent Pituitary Tumors

Treatment may include the following:

- Radiation therapy.

A clinical trial of Stereotactic radiation surgery.