



### Hypothalamic-pituitary (H-P) brain tumors

These are abnormal growths that affect regions of the brain including the hypothalamus, pituitary gland, and optic (eye) nerves. Craniopharyngioma, germinoma, glioma, and hamartoma are examples of H-P tumors. Although many of these tumors do not spread to other parts of the brain or body, they often lead to medical conditions that can require lifelong management (medications, regular doctor visits, etc.), even after the tumors are removed through surgery or radiation.



### Common medical conditions after an H-P tumor

The hypothalamus, which is a part of the brain, and the pituitary gland, which sits beneath the brain, are responsible for hormone function. Hormones are chemical messengers. The hypothalamus is responsible for regulating the internal balance of the body (called homeostasis), regulating the pituitary gland's production of hormones, and producing two hormones itself. The pituitary gland is responsible for producing six other hormones and releasing them into the bloodstream. After the removal of an H-P tumor, the hypothalamus and pituitary gland are often damaged and can no longer make or regulate hormones. These hormones are essential for life; fortunately, there are medications that can be taken to replace the hormones that the damaged hypothalamus and pituitary gland can no longer make.



### Importance of continuing your medical care

Even after the brain tumor is removed, the conditions in the aftermath of an H-P tumor are chronic and require careful, lifelong management; a team of doctors works with the patient, including specialists in endocrinology (hormones), ophthalmology/optometry (eye/vision), neurology (nervous system), psychiatry (emotion-behavior), and rehabilitation (physical, speech, and occupational therapies). Having the conditions of an H-P tumor can feel overwhelming to manage, which makes it even more important to keep regular medical appointments and to reach out for help with questions or for support.



### Get support from Raymond A. Wood Foundation

Raymond A. Wood Foundation (RAWF) is a patient advocacy organization founded by the parents of a boy with craniopharyngioma. RAWF's mission is to improve the lives of H-P tumor patients, and we offer research, education, support, and other helpful resources to help H-P tumor patients and their families.

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## Hypothalamic-pituitary tumors and their associated endocrine conditions



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## HYPOPITUITARISM

When a person does not make an essential hormone, the condition is called hypopituitarism. Each missing essential hormone is associated with a medical condition and need for a replacement hormone:

- **Growth hormone-** This hormone is responsible for regulating growth, fat, muscle, tissue, and bone. When a person has **growth hormone deficiency**, growth hormone injections help replace this important hormone for children and adults.
- **Cortisol-** This essential hormone is responsible for regulating the body's stress response. When cortisol is missing, the condition is called **adrenal insufficiency**, and a person with adrenal insufficiency replaces cortisol with a type of medication called corticosteroids (e.g., hydrocortisone). When a person with adrenal insufficiency is seriously ill or is vomiting and cannot absorb the oral medication, the person will require a lifesaving "stress dose" injection of Solu-Cortef medicine. This is a very serious situation called adrenal crisis, and it is extremely important to give the injection right away; not doing so could result in death.
- **Thyroid-** This hormone is responsible for many functions throughout the body, including growth, and heart, muscle, and digestive function; a person who is deficient in thyroid hormone has a condition called **hypothyroidism**. This condition is treated by replacing thyroid hormones, thyroxine (T4) and (sometimes) triiodothyronine (T3).

■ **Sex hormones-** These hormones are responsible for puberty, menstruation, sex drive, sperm production, and pregnancy. When a person is unable to produce sex hormones, the condition is called **hypogonadotropic hypogonadism**. Males with this condition replace testosterone, and females replace estrogen and progesterone.

■ **Vasopressin-** This hormone, made in the hypothalamus, also known as antidiuretic hormone, is responsible for blood pressure and fluid control of the body. A person with vasopressin deficiency has a condition called diabetes insipidus, or DI. Not to be confused with sugar diabetes (diabetes mellitus), DI causes a person to be unable to regulate their fluid balance and electrolytes, and is treated with a replacement hormone called desmopressin, or DDAVP.

■ **Oxytocin-** This hormone, although not typically replaced in people with hypopituitarism, is another hormone that is made in the hypothalamus. Oxytocin is responsible for functions including lactation and labor contractions but is also being studied as a hormone that plays a role in social bonding, autism, mood problems, appetite regulation, and more.

## HYPOTHALAMIC SYNDROME

When the hypothalamus is damaged by the tumor or treatment, the brain is no longer able to keep the body in balance, and this can result in certain symptoms, including:

- **Hypothalamic obesity-** This condition can cause rapid weight gain, extreme hunger, and food obsessions.
- **Adipsia or polydipsia-** A person with these conditions does not have an intact thirst mechanism, and it can cause a person to feel no thirst or to feel excessively thirsty.
- **Temperature dysregulation-** This condition causes a person to have difficulty in regulating body temperature and may make warmer or colder temperatures difficult to tolerate.
- **Sleep difficulties-** The hypothalamus is responsible for circadian rhythm, the body's clock, and a damaged hypothalamus may cause sleep irregularities, including daytime sleepiness and nighttime insomnia.
- **Energy problems-** A person with this condition may experience extreme fatigue and low motivation.
- **Social and mood disturbance-** A person with this condition may feel less interested in connecting socially and feel anxious or depressed.

