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## Pituitary tumour

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### Summary

- The pituitary gland at the base of the brain oversees the endocrine system and controls hormone levels.
  - Some pituitary tumours produce hormones, but most do not.
  - Treatment for pituitary tumours includes surgery to remove the tumour, radiation therapy and medication.
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The endocrine system is made up of glands that secrete chemicals called hormones into the bloodstream. The master gland is the pituitary, a pea-sized structure located at the base of the brain just behind the nose.

The pituitary oversees the other glands of the endocrine system and controls hormone levels. It can bring about a change in hormone production somewhere else in the system by releasing its own 'stimulating' hormones. The pituitary gland is also connected to the nervous system by a part of the brain called the hypothalamus.

A pituitary tumour (also called an adenoma) is a mass of cells that grow on the gland. Some tumours release hormones, although most do not. Generally, pituitary tumours are benign (not cancerous) and slow growing, and pituitary cancers are rare. Benign tumours don't spread to other parts of the body, so there is no chance of secondary tumours developing. Treatment may include surgery, radiation therapy and medication.

### Symptoms of pituitary tumours

Symptoms of a pituitary tumour may have different causes. If the tumour is releasing a hormone, high levels of that hormone may be present in the bloodstream. If the normal pituitary gland function has been affected, there may be lower levels of one or more of the pituitary hormones.

There could also be symptoms caused by a growth or 'mass effect', resulting in pressure of the tumour on surrounding structures.

Symptoms may include:

- visual disturbances, such as loss of peripheral vision (giving you 'tunnel vision') or (rarely) double vision
- loss of libido (sex drive) or erectile dysfunction (inability to have an erection) in men
- menstrual period irregularities in women
- changes to appearance
- cognitive difficulties, including problems with thinking
- persistent headaches
- nausea and vomiting
- light-headedness on standing up
- fatigue.

### Roles of the pituitary gland

The pituitary gland regulates many important bodily processes by releasing hormones into the bloodstream. Some of the key hormones include:

- Adrenocorticotropic hormone (ACTH) – stimulates the adrenal glands to produce the hormone cortisol, which is essential for life and helps to regulate blood pressure and blood sugar levels.
  - Antidiuretic hormone (ADH) – helps the kidneys to maintain the correct amount of water in the body.
  - Follicle stimulating hormone (FSH) and luteinising hormone (LH) – regulate the menstrual cycle in women, sperm production in men and sex hormone levels in both sexes.
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- Growth hormone – influences a person’s height, contributes to bone and muscle building and influences the control of body fat.
- Oxytocin – is involved in childbirth and breastfeeding. This hormone is also thought to help relieve the physical effects of stress.
- Prolactin – prompts milk production after childbirth.
- Thyroid stimulating hormone (TSH) – stimulates the thyroid gland to produce the hormone thyroxine, which regulates energy expenditure.

### **Types of pituitary tumours**

Although the effects of pituitary tumours are understood, like many tumours, the causes remain largely unknown. A small percentage may arise because of an altered gene.

The different types of pituitary tumour include:

- non-functioning pituitary tumour
- ACTH-producing tumour
- prolactin-producing tumour (prolactinoma)
- growth hormone-producing tumour.

### **Non-functioning pituitary tumour**

This is the most common pituitary tumour and doesn’t release any hormones. Symptoms are caused by a deficiency in the normal pituitary hormones (because the tumour restricts the function of the normal gland), or by pressure on surrounding structures near the pituitary.

Some of the symptoms of a non-functioning pituitary tumour include:

- general fatigue and feeling unwell
- persistent headaches
- menstrual cycle irregularities
- loss of peripheral vision
- loss of libido.

### **ACTH-producing tumour**

This type of tumour secretes adrenocorticotrophic hormone (ACTH), which causes the adrenal glands (situated above the kidneys) to produce greater than normal amounts of cortisol. This causes a disorder known as Cushing’s disease.

Too much circulating cortisol may also occur due to non-pituitary influences, including adrenal gland tumours or other tumours outside the pituitary that make too much ACTH. These result in a clinical syndrome called Cushing’s syndrome.

The symptoms include:

- build-up of fat on the face (producing a ‘moon face’ appearance) plus a build-up of fat on the abdomen and upper back
- wasting of the arm and leg muscles
- high blood sugar levels
- a reddened, flushed face
- high blood pressure (hypertension)
- osteoporosis (thinning of the bones)
- thinning of the skin and easy bruising
- purple stretch marks.

### **Prolactin-producing tumour**

This type of tumour releases prolactin, the hormone that naturally increases during pregnancy and after childbirth to stimulate milk production. A woman with a prolactin-producing tumour (prolactinoma) may have irregular or absent menstrual periods and her breasts may make milk, even if she isn't pregnant.

The effects of this type of tumour in men include loss of libido and erectile dysfunction.

### **Growth hormone-producing tumour**

This type of tumour releases growth hormone. Too much growth hormone forces certain body structures such as the face, hands and feet to enlarge and thicken considerably. This condition is called acromegaly, or gigantism if it occurs before growth stops during the adolescent years.

The cardiovascular changes caused by the high levels of growth hormone can be fatal if untreated. This condition also increases the risk of bowel polyps and cancer.

### **Diagnosis of pituitary tumours**

A pituitary tumour is diagnosed using a number of tests including:

- medical history
- physical examination
- blood tests
- magnetic resonance imaging (MRI) scans
- computed tomography (CT) scans.

### **Treatment for pituitary tumours**

Treatment depends on the type and size of the tumour, and the person's age and general health. Generally, the treatment options include:

- Surgery – the pituitary gland is accessed via the nasal cavity and sinuses and no visible cuts are made. The tumour is removed using an endoscope or microscope. In rare cases, the tumour may have to be removed through the front of the skull (craniotomy). Surgery is the first-line treatment for all tumours except prolactinomas.
- Radiation therapy – targets and destroys the tumour cells. Radiosurgery is focused radiotherapy that has improved the accuracy and minimised the risks of treating pituitary tumours. Radiosurgery is used in conjunction with surgery and medications to control the growth of tumours or to stop the activity of hormone-releasing tumours.
- Medication – to shrink the tumour and stop it from producing hormones. Medication is the first line of treatment for prolactinoma. Hormone replacement therapy may also be required in cases of pituitary hypofunction or post-operatively.

### **Specialist advice about pituitary tumours**

Your doctor may refer you to a medical specialist such as:

- an endocrinologist – one who is experienced in the management of pituitary tumours. They will decide on the appropriate investigations. If surgery is necessary, they will refer you to a neurosurgeon with a special interest in pituitary tumour surgery
- a neurosurgeon – the skill of the neurosurgeon (particularly one who treats pituitary tumours regularly) is the most important variable in a cure, especially for functioning tumours (ones that are making excessive amounts of a hormone).

### **Where to get help**

- Your doctor
- Specialist endocrinologist
- Specialist neurosurgeon
- Australian Pituitary Foundation Tel. 1300 331 807

### **Things to remember**

- The pituitary gland at the base of the brain oversees the endocrine system and controls hormone levels.
- Some pituitary tumours produce hormones, but most do not.
- Treatment for pituitary tumours includes surgery to remove the tumour, radiation therapy and medication.

**This page has been produced in consultation with and approved by:**

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