HEALTH BASICS

Endocrine glands

Endocrine glands are organs that release hormones to coordinate important body functions.

WHAT IT IS
Organs that release hormones into the bloodstream

WHERE IT COMES UP
Hormone tests, scans, medicines, and endocrine diagnoses

WHY IT MATTERS
Hormones coordinate metabolism, growth, reproduction, stress, and fluid balance

WHAT IT IS NOT
Not a disease or diagnosis

WHO TO ASK
Primary care clinician or endocrinology service

HOW IT IS CHECKED
Blood, urine, imaging, or stimulation tests when clinically needed

Overview

Endocrine glands are organs that make and release hormones. Hormones are chemical messengers. They travel through the blood and help coordinate processes in different parts of your body.

Endocrine glands are not a disease or diagnosis. You may hear about them when discussing a hormone blood test, a scan, a medicine, or a condition such as diabetes or a thyroid disorder.

The main endocrine glands and hormone-producing organs include:

The hypothalamus, a part of the brain, controls many pituitary hormones. Other organs, including the kidneys, heart, gut, liver, and body fat, also make hormones even though they are not usually described as classic endocrine glands.

Endocrine glands differ from exocrine glands. Endocrine glands release hormones into the blood. Exocrine glands release substances through tubes called ducts. Sweat glands and salivary glands are examples of exocrine glands. The pancreas does both: it releases hormones into the blood and digestive enzymes into the intestine.

- The pituitary gland at the base of the brain

- The thyroid and parathyroid glands in the neck
- The adrenal glands above the kidneys
- Hormone-producing cells in the pancreas
- The ovaries or testes
- The pineal gland in the brain
- The placenta during pregnancy

How it works

A hormone affects only cells that have the right receptor. A receptor is a structure that recognizes and responds to a particular hormone. This is sometimes compared with a key fitting a lock.

Hormones help regulate:

Many hormone systems use feedback loops. For example, the pituitary releases thyroid-stimulating hormone, or TSH. TSH tells the thyroid to make thyroid hormones. As thyroid hormone levels rise, signals return to the pituitary and hypothalamus, reducing further stimulation.

This feedback helps keep hormone levels within a useful range. It also means that clinicians often test more than one hormone to find where a problem may be occurring. A thyroid assessment, for example, may include both TSH and a thyroid hormone called free T4.

Hormone release is not always steady. Levels may change with the time of day, menstrual cycle, pregnancy, sleep, meals, stress, illness, or exercise. Some hormones are released in short pulses. A single result therefore needs to be interpreted in context.

- How your body uses and stores energy
- Blood glucose, also called blood sugar
- Growth and development
- Sexual function, fertility, and pregnancy
- Blood pressure and the balance of salt and water
- Calcium levels and bone health
- Responses to physical and emotional stress
- Sleep timing and daily body rhythms

Why it matters for your health

Hormones connect systems that might otherwise seem unrelated. A change in one gland can affect several organs, while an illness elsewhere in the body can temporarily change hormone results.

Endocrine testing may be used to investigate a specific concern, monitor a known condition, check treatment, or assess a finding seen on a scan. Imaging sometimes finds a small growth in an endocrine gland by chance. This is often called an incidental finding or incidentaloma. It does not automatically mean cancer or a hormone disorder.

No single test checks every endocrine gland. Tests are selected according to the hormone or condition being considered. They may include blood or urine measurements, genetic testing, ultrasound, CT, MRI, or nuclear medicine imaging.

Some assessments use a stimulation or suppression test. In these tests, a substance is given to see whether hormone levels rise or fall as expected. These tests are arranged and interpreted by a clinical team because timing, medicines, and the testing method can affect the result.

A result outside the laboratory reference range does not always confirm a disorder. Reference ranges can differ between laboratories, and some results need repeating. Clinicians may also compare related hormones rather than judging one number alone.

What can go wrong

Conditions involving endocrine glands usually result from too much hormone, too little hormone, an abnormal response to a hormone, or a growth affecting the gland.

Examples include:

Causes can include autoimmune disease, genetic changes, infection, inflammation, injury, surgery, radiation treatment, or medicines. Some tumors release hormones. Others affect a gland without changing hormone production.

Many endocrine findings are managed through routine appointments. Arrange routine follow-up if you have an unexplained abnormal hormone result, a newly identified gland nodule, persistent changes that may be hormone-related, or questions about monitoring an established condition.

Some diagnosed endocrine conditions can cause emergencies. Seek urgent medical help for severe confusion, fainting, a seizure, major breathing difficulty, or persistent vomiting with extreme weakness. Follow your emergency plan if you have known adrenal insufficiency or

diabetes and develop warning signs your clinical team has discussed with you. These situations relate to specific medical conditions, not to endocrine glands as a normal body system.

- Thyroid disorders , such as hypothyroidism, hyperthyroidism, thyroid nodules, and thyroid cancer
- Diabetes mellitus , involving insulin production or the body's response to insulin
- Adrenal disorders , such as adrenal insufficiency, Cushing syndrome, and primary aldosteronism
- Parathyroid disorders , which can disturb calcium levels
- Pituitary disorders , including hormone-producing tumors or reduced pituitary function
- Reproductive hormone disorders , such as hypogonadism and polycystic ovary syndrome
- Hormone resistance , in which body tissues do not respond normally to a hormone

What you can do

There is no routine test that checks all endocrine glands, and most people do not need endocrine screening without a specific reason.

If a hormone test is suggested, useful questions include:

Do not stop a prescribed medicine before testing unless the clinician arranging the test tells you to do so. Bring an up-to-date list of prescriptions, over-the-counter products, and supplements. Biotin, which is found in some hair and nail supplements, can interfere with certain laboratory tests.

If you are being assessed for a possible hormone problem, keep a brief record of the changes that prompted testing and when they occur. Depending on the issue, useful records may include menstrual dates, home glucose readings, blood pressure measurements, or the timing of symptoms. Record only information relevant to the planned assessment.

For an incidental finding on a scan, ask whether it produces hormones, whether its appearance needs more imaging, and what follow-up is planned. Sometimes no action is needed beyond reviewing the scan and relevant test results.

- Which hormone and gland are being assessed?
- Does the test need to happen at a certain time?
- Do I need to fast or change my usual routine?
- Could any medicines or supplements affect the result?

- Will an unexpected result need repeating or confirming?

Common questions

Are all hormones made by endocrine glands?

No. Many organs and tissues make hormones. The kidneys, heart, gut, liver, and body fat all release chemical signals with hormone-like effects.

Is the pituitary the "master gland"?

The pituitary controls several other endocrine glands, so it is often called the master gland. However, it is itself regulated by the hypothalamus, and not every hormone system is controlled by the pituitary.

Can one blood test show whether my endocrine system is healthy?

No. Different glands make different hormones, and testing is chosen for a specific clinical question. Timing and related hormone levels may also matter.

Does an abnormal hormone result mean I have an endocrine disease?

Not necessarily. Illness, stress, pregnancy, medicines, supplements, test timing, and laboratory methods can affect results. Some findings need to be repeated or checked with another test.

Does a lump in an endocrine gland mean cancer?

No. Nodules and other growths can be benign, meaning non-cancerous. Assessment may consider the growth's size, appearance, changes over time, and whether it releases hormones.

What is an endocrinologist?

An endocrinologist is a clinician who specializes in hormone-related conditions. Primary care clinicians manage many common endocrine issues and may refer you when specialist testing or treatment is needed.

Sources

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- National Institute of Diabetes and Digestive and Kidney Diseases: Endocrine Diseases , information on endocrine and metabolic conditions
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