

Excess and deficiency

An **excess** – too much, or a **deficiency** – too little, of circulating **hormones** cause a wide range of medical conditions, for example **hyperthyroidism** and **hypothyroidism**. Where there is an excess of hormone, one form of treatment consists of giving the patient something which **inhibits** the production of that hormone, as in the use of carbimazole to treat hyperthyroidism. When a hormone is **deficient**, treatment may be by **replacement therapy**, for example injections of insulin in the treatment of Type 1 diabetes.

Doctors say:

Sufferers of type 1 diabetes are
deficient in insulin.

Negative feedback systems

1 TRH (thyrotropin-releasing hormone) is **secreted** in the hypothalamus and **triggers** the **production** of TSH (thyroid-stimulating hormone) in the pituitary.

2 TSH **stimulates** the TSH receptor in the thyroid to increase **synthesis** of both T4 (thyroxine) and T3 (triiodothyronine) and also to **release** stored hormone, producing increased plasma levels of T4 and T3.

3 T3 **feeds back** on the pituitary and perhaps the hypothalamus to inhibit TRH and TSH secretion.

Goitre

An enlarged thyroid gland is called a **goitre**. The enlargement may be **diffuse** – involving most of the gland, or **localized** – limited to a particular area, as in a **solitary** (single) nodule. The increased blood flow in diffuse enlargement, for example in Graves' disease, may give rise to a palpable **thrill** – vibration felt with the hand, and an audible **bruit** – noise heard through a stethoscope, over the gland.

A letter of referral

Mrs Davis's doctor has referred her to an endocrinologist.

Dear Doctor,

I would be grateful if you would see this 50 – year – old woman who has lost 20 kilos in weight in spite of eating more than usual. She describes herself as **overactive** and at first she thought the weight loss was due to this. But more recently she has developed **palpitations**, diarrhoea, and **heat intolerance**. She has noticed that her hands have a tendency to shake.

Her symptoms suggested hyperthyroidism and this was confirmed by my examination which revealed an enlarged thyroid, red sweaty palms and a **fine tremor** of the hands.

overactive: more active than is usual

palpitations: awareness of rapid or irregular heartbeat

heat intolerance: inability to cope with high temperatures

fine tremor: very slight involuntary movements

Complete the table with words from the above text.

Verb	Noun
inhibit	
produce	
release	
replace	
	secretion
	stimulation

Complete the passage from a textbook, using your own knowledge and the information from the above text.

Pulses of GnRH (gonadotrophin-releasing hormone) are released from the hypothalamus and

(1) _____ LH and FSH (2) _____ from the pituitary. LH

(3) _____ testosterone (4) _____ from Leydig cells of the testis.

Testosterone (5) _____ back on the hypothalamus / pituitary to (6) _____ GnRH (7) _____. FSH (8) _____ the Sertoli cells in the seminiferous tubules to (9) _____ mature sperm and the inhibins A and B. Inhibin causes feedback on the pituitary to decrease FSH (10) _____.

Complete the sentences.

1. A _____ change affects many parts of an organ or gland.
2. A _____ change affects only one part.
3. His diet is _____ in iron: he doesn't get enough iron.
4. _____ T3 and T4 increase the basal metabolic rate.

Match Mrs Davis's symptoms (1-7) with the questions her doctor asked (a-g).

1 diarrhoea

2 eating more

3 heat intolerance

4 overactivity

5 palpitations

a Do you prefer hot weather or cold?

b Is your weight steady?

c What is your appetite like?

d Are your bowels normal?

e Are you able to sit and relax?

6 weight loss

7 tremor

f Do your hands shake?

g Have you ever felt your heart
beating rapidly or irregularly?

Express your idea.

Write a referral letter to an endocrinologist for a patient who you believe has hypothyroidism.

Use the letter in the above text as a model.