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## Sweat

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### Summary

- Sweat keeps the body cool as it evaporates from the skin.
  - Heat stroke occurs when sweat can't evaporate fast enough to cool the body.
  - Hyperhidrosis is excessive sweating.
  - Known causes of heavy sweating include obesity, thyroid disease and diabetes.
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Sweat is produced by glands in the deeper layer of the skin, the dermis. Sweat glands occur all over the body, but are most numerous on the forehead, the armpits, the palms and the soles of the feet. Sweat is mainly water, but it also contains some salts. Its main function is to control body temperature. As the water in the sweat evaporates, the surface of the skin cools. An additional function of sweat is to help with gripping, by slightly moistening the palms.

### Normal sweating

Normal, healthy sweating is caused by:

- hot temperatures, such as in summer
- physical exercise
- emotional stress
- eating hot or spicy foods
- fever associated with illness.

### Increased sweating (hyperhidrosis)

Excessive sweating is known as hyperhidrosis. Idiopathic hyperhidrosis is the most common form. It is called idiopathic because no cause can be found for it. It can develop during childhood or later in life and can affect any part of the body, but the palms and soles or the armpits are the most commonly affected areas. The excessive sweating may occur even during cool weather, but it is worse during warm weather and when a person is under emotional stress.

Some known causes include:

- obesity
- hormonal changes associated with menopause (hot flushes)
- illnesses associated with fever, such as infection or malaria
- an overactive thyroid gland (hyperthyroidism)
- diabetes
- certain medications.

In most cases, no investigations are required to diagnose hyperhidrosis. Occasionally, a blood test for thyroid disease is recommended.

### Treatment for excessive sweating

Treatment for excessive sweating depends on the cause. It may include:

- weight reduction – if the person is overweight
  - topical applications (applying prescribed substances to the skin) such as:
    - antiperspirants with 10–25% aluminium salts
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- ‘anticholinergic’ medications, which may be available as a cream, spray, powder, stick, roll-on, wipe and paint
- medical management, for example:
  - oral ‘anticholinergic’ medications can be prescribed to block the activation of sweat glands
  - hormone replacement therapy can be prescribed to reduce the hot flushes of menopause
- iontophoresis – the activity of sweat glands is temporarily reduced by passing a low-level electric current through the skin
- botox injections – to paralyse sweat glands. The effect from a single injection lasts six to nine months
- non-invasive microwave treatment (the MiraDry® system approved by FDA in 2011) – for excessive sweating of armpits
- surgery to the nerves that control sweat glands – may be considered in severe cases where all other treatments have been unsuccessful.

### **Self-help strategies for hyperhidrosis**

Some strategies for managing hyperhidrosis at home include:

- Wear loose clothing.
- Use antiperspirants that contain aluminium chloride and are designed for hyperhidrosis – follow the instructions carefully. While advertised mainly for use in the armpits, these agents can also be used on the palms, soles and forehead or wherever the hyperhidrosis occurs.

### **Reduced sweating (hypohidrosis)**

Reduced sweating is called hypohidrosis if there is partial loss of sweating, or anhidrosis if there is complete lack of sweating. This can occur for a number of reasons, which include:

- some skin disorders
- burns to skin that damage the sweat glands
- underactive thyroid (hypothyroidism)
- dehydration
- prolonged excessive heat or exercise during hot weather.

Lack of sweating may create problems of temperature control and lead to steep rises in body temperature during hot weather. Occasionally, this can be life threatening.

### **Heat stroke and heat exhaustion**

Heat stroke (or sun stroke) can occur in hot weather when not enough sweat is produced to keep the body cool. Symptoms can include:

- muscle cramps
- headache
- nausea
- vomiting.

Excessive loss of body salts and water can lead to a life-threatening complication known as heat exhaustion. Heat stroke can be managed, and heat exhaustion prevented, by seeking a cool, shaded place, drinking plenty of fluids and sponging the body with water, if necessary.

### **Where to get help**

- Your **GP (doctor)**
- A **dermatologist**
- **Subscribe to heat health alerts**

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