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The body needs to maintain its temperature to stay fit and healthy. Just a few degrees too hot and things could go very wrong. Helen Cowan tells us about our bodies in heat and why we ought to be careful in hot weather.

The need for heat, but not too hot

Humans are homeotherms which means we need to maintain a constant core temperature—deep within our chest and abdomen, usually between 36 to 38°C. This temperature varies throughout the day and during the menstrual cycle, and is a good indicator for natural family planning [3].

When temperature isn't kept constant serious problems can happen. Hypothermia occurs when body temperature drops below 35°C whereas hyperthermia occurs above 40°C, both are due to failed thermoregulation. Brain cells are especially sensitive to heat, with brain damage beginning at 42°C. Almost all body cells are killed at 50°C.

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Don't sweat it!

When temperatures rise, sweating is the secret to a constant core temperature: as sweat evaporates, it removes heat from the body, cooling it down. Humans are particularly successful sweaters, having about 3 million sweat glands, little body hair and relatively long, slim limbs.

And, according to the old adage, men really do perspire, whilst ladies glow, since men produce about twice as much sweat as women.

Sweat too much and you can deplete the body of up to 12 litres of water and 3 teaspoons of salt in a day. Dehydration thickens the blood, damaging cells and can cause a stroke as salt loss can interfere with the electrical activity of the heart and brain and lead to muscle cramps.

Impaired sweating can lead to heatstroke, a medical emergency in which the core temperature rises dangerously. Headache, dizziness, agitation, confusion, seizures and death may result.

Sweating slows down in humid, windless conditions: the humidity of a steam room makes it less bearable than a sauna; your temperature rises further on a stationary exercise bike than on a bicycle, owing to the lack of headwind to speed up sweating. Athletes who collapse soon after a race are likely to be experiencing an abrupt halt in their ability to sweat as they stand still, suddenly overheating.

People with cystic fibrosis also have impaired sweating, and the sweat they do produce is characteristically salty, thus being a useful diagnostic tool for the disease. Nerve damage associated with diabetes or Parkinson's disease [4] can also interfere with the workings of the sweat glands.

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Help in the heat

Eating a little less (since digestion generates heat), drinking more and wearing sunscreen can help. And don't follow the example of mad dogs and Englishmen: stay out of the midday sun and go for a siesta (being less physically active will reduce heat production). Oh, and keep your cotton shirt [5] on – contrary to belief, it will speed up sweating by keeping a layer of air moving against the skin, whilst also protecting from the sun's rays.In addition to dehydration and heatstroke, the Met Office reports that hot weather is hazardous to health because of increased air pollution [6] (affecting breathing), sunburn and drowning.

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