

# heatwave

SUPPORTING VULNERABLE PEOPLE  
BEFORE AND DURING A HEATWAVE

Advice for health and social care professionals

Extreme heat is dangerous to everyone. During a heatwave, when temperatures remain abnormally high over more than a couple of days, it can prove fatal. Climate change means heatwaves are likely to become more common in England. In one hot spell in London in August 2003, deaths among people aged over 75 rose by 60 per cent.

This factsheet is part of a national programme to reduce the health risks by alerting people to the dangers and encouraging them to plan in advance what to do in the event of a heatwave. Heatwaves can happen with little warning and illness and death can occur within the first couple of days, so it is best to make the following preparations before high temperatures are forecast. Ideally these should be complete by the beginning of June.

You should be reading this, and are urged to act on it, if you work, whether as an individual or part of a team, in primary care or social services or are a home care provider. It offers advice both on caring for people most at risk during a heatwave, and on organising others who provide care. Example advice cards can be found in Annex on page 12.

## Who is at risk?

There are certain factors that increase an individual's risk during a heatwave. These include:

- **Older age:** especially women over 75 years old, or those living on their own and who are socially isolated, or in a care home.
- **Chronic and severe illness:** including heart conditions, diabetes, respiratory or renal insufficiency, Parkinson's disease or severe mental illness. Medications that potentially affect renal function, sweating, thermoregulation or electrolyte balance can make this group more vulnerable to the effects of heat (see **Additional notes** on page 8).
- **Inability to adapt behaviour to keep cool:** having Alzheimer's, a disability, being bed bound, too much alcohol, babies and the very young.
- **Environmental factors and overexposure:** living in a top floor flat, being homeless, activities or jobs that are in hot places or outdoors and include high levels of physical exertion.

During extremely hot weather, there is a risk of developing heat exhaustion and heatstroke and other heat-related illnesses including respiratory and heart problems. In a moderate heatwave, it is mainly the above high-risk groups that are affected. However, during an extreme heatwave such as the one affecting France in 2003, normally fit and healthy people can also be affected.

## What are the risks? The effects of heat on health

The body normally cools itself using four mechanisms:

- **radiation** in the form of infrared rays;
- **convection** via water or air crossing the skin;
- **conduction** by a cooler object being in contact with the skin; and
- **evaporation** of sweat.

When the ambient temperature is higher than skin temperature, the only effective heat-loss mechanism is sweating. Therefore, any factor that reduces the effectiveness of sweating such as dehydration, lack of breeze, tight-fitting clothes or certain medications can cause the body to overheat. Additionally, thermoregulation, which is controlled by the hypothalamus, can be impaired in the elderly and the chronically ill, and potentially in those taking certain medications, rendering the body more vulnerable to overheating. Young children produce more metabolic heat, have a decreased ability to sweat and have core temperatures that rise faster during dehydration. Older women appear to be more vulnerable to the effects of heat than older men, possibly due to having fewer sweat glands and being more likely to live on their own.

The box on page 4 describes the effects of overheating on the body, which in the form of heatstroke can be fatal.

However, the main causes of illness and death during a heatwave are respiratory and cardiovascular diseases. A linear relationship between temperature and weekly mortality was observed in England in summer 2006, with an estimated 75 extra deaths per week for each degree of increase in temperature. Part of this rise in mortality may be attributable to air pollution, which makes respiratory symptoms worse. The other main contributor is the effect of heat on the cardiovascular system. In order to keep cool, large quantities of extra blood are circulated to the skin. This causes strain on the heart, which for elderly people and those with chronic health problems can be enough to precipitate a cardiac event.

Sweating and dehydration affect electrolyte balance. For people on medications that control electrolyte balance or cardiac function, this can also be a risk. Medicines that affect the ability to sweat, thermoregulation or electrolyte imbalance can make a person more vulnerable to the effects of heat. Such medicines include anticholinergics, vasoconstrictors, antihistamines, drugs that reduce renal function, diuretics, psychoactive drugs and antihypertensives.

## Heat-related illnesses

- **Increased risk of cardiovascular and respiratory illnesses** – these cause the majority of excess mortality during a heatwave.
- **Heat cramps** – caused by dehydration and loss of electrolytes, often following exercise.
- **Heat rash** – small, red, itchy papules.
- **Heat oedema** – mainly in the ankles, due to vasodilation and retention of fluid.
- **Heat syncope** – dizziness and fainting, due to dehydration, vasodilation, cardiovascular disease and certain medications.
- **Heat exhaustion** – is more common. It occurs as a result of water or sodium depletion, with non-specific features of malaise, vomiting and circulatory collapse, and is present when the core temperature is between 37°C and 40°C. Left untreated, heat exhaustion may evolve into heatstroke.
- **Heatstroke** – can become a point of no return whereby the body's thermoregulation mechanism fails. This leads to a medical emergency, with symptoms of confusion; disorientation; convulsions; unconsciousness; hot dry skin; and core body temperature exceeding 40°C for between 45 minutes and eight hours. It can result in cell death, organ failure, brain damage or death. Heatstroke can be either classical or exertional (e.g. in athletes).

Whatever the underlying cause of heat-related symptoms, the treatment is always the same – move the person to somewhere cooler and cool them down.

## Reducing the risk before a heatwave

Heatwaves can happen suddenly, and rapid rises in temperature affect vulnerable people **very rapidly**. Make as much use as possible of existing care plans to assess which individuals are at particular risk, and to identify what extra help they might need.

Health and social care providers need to plan ahead to ensure that care and support for people at risk can be accessed in the event of a heatwave. Anyone in a high-risk category who is living alone is likely to need at least daily contact, whether by care workers, volunteers or informal carers. Older people, especially older women, people with chronic or serious illness, mobility problems, or severe mental illness, those who are on certain medications, or those living in accommodation that is hard to keep cool, may need extra care and support.

If you are advising, visiting, supporting or caring for someone in their own home, these are the steps that should be taken **before** the weather gets hot. Where possible, involve their family and any informal carers in these arrangements.

### Environment

- Plant trees or leafy plants to provide shade and cool the air around the building. Indoor plants also help keep the environment cool.
- Check that any south-facing windows, which let in most sunlight, can be shaded, preferably with curtains with pale, reflective linings. Metal venetian blinds and curtains with dark linings absorb heat and may make things worse.
- Consider outside shutters, overhead external shade and using reflective paint.
- Check that the person's home or room can be properly ventilated, without causing any additional health risk, discomfort or security problems.
- Consider the possibility of moving the person to a cooler room. People living in top floor accommodation may be at particular risk as heat rises.

### Facilities

- Check that fridges and freezers work properly.
- Check that the person has light, loose-fitting cotton clothing to wear.
- If you plan to move the person somewhere cooler in the event of a heatwave, consider what equipment or help you might need.
- Check that fans and air-conditioning work properly, and replace appliances with energy-efficient models.

### Organisation

- Check that extra care and support are available if needed.
- Check that the person can contact the primary care team if one of their informal carers is unavailable.
- Check that their care plan contains contact details for their GP, other care workers and informal carers.
- Check that there are adequate arrangements for food shopping to reduce having to go out in hot weather.

## If a heatwave is forecast for your region

- Make sure you have taken the steps outlined above.
- Monitor the current situation by checking the Heat-Health Watch level on the internet ([www.metoffice.gov.uk](http://www.metoffice.gov.uk)) or listening to local weather news.
- Make sure you know what advice to give people at risk. A public information leaflet with tips on what to do in a heatwave is available from GP practices, pharmacies, NHS walk-in centres, hospitals, care homes, benefit offices and voluntary organisations.
- Suggest that people at particular risk consult their GP about possible changes to their treatment and/or medication (see **Additional notes** on page 8).

## During a heatwave

### How to keep out the heat

- Keep curtains on windows exposed to the sun closed while the temperature outside is higher than it is inside.
- Once the temperature outside has dropped lower than it is inside, open the windows. This may require late night visiting.
- Water external and internal plants, and spray the ground outside windows with water (avoid creating slip hazards) to help cool the air.
- Advise the person to stay out of the sun, especially between the hours of 11.00am and 3.00pm.
- Advise them to stay in the shade and to wear hats, sunscreen, thin scarves and light clothing if going outside.

### How to keep body temperatures down

- Ensure that the person reduces their levels of physical exertion.
- Suggest they take regular cool showers or baths, or at least an overall body wash.
- Advise them to wear light, loose cotton clothes to absorb sweat and prevent skin irritation.
- Suggest that they sprinkle their clothes with water regularly, and splash cool water on their face and the back of their neck. A damp cloth on the back of the neck helps temperature regulation.

- Recommend cold food, particularly salads and fruit with a high water content.
- Advise them to drink regularly, preferably water or fruit juice, but avoid alcohol and caffeine (tea, coffee, colas).
- Monitor their daily fluid intake, particularly if they have several carers or are not always able to drink unaided.

### Provide extra care

- Keep in regular contact throughout the heatwave, and try to arrange for someone to visit at least once a day.
- Keep giving advice on what to do to help keep cool.

### Be alert

As well as the specific symptoms of heat exhaustion and heatstroke, watch out for signs that could be attributed to other causes, such as:

- difficulty sleeping, drowsiness, faintness and changes in behaviour;
- increased body temperature;
- difficulty breathing and increased heart rate;
- dehydration, nausea or vomiting; or
- worsening health problems, especially of heart or respiratory system.

## Emergency treatment

If you suspect someone has heatstroke, call 999. While waiting for the ambulance:

- take the person's temperature;
- if possible, move them somewhere cooler;
- cool them down as quickly as possible by giving them a cool shower, sprinkling them with water or wrapping them in a damp sheet, and using a fan to create an air current;
- encourage them to drink fluids, if they are conscious;
- give them a saline drip and oxygen if they are unwell; and
- do **not** give aspirin or paracetamol.

## Additional notes

### Chronic or severe illness

People with chronic or severe illness are likely to be at particular risk, including the following conditions:

- Respiratory disease
- Cardiovascular and cerebrovascular conditions
- Diabetes and obesity
- Severe mental illness
- Parkinson's disease and difficulties with mobility
- Renal insufficiency
- Peripheral vascular conditions
- Alzheimer's or related diseases.

## Medications

The following drugs are theoretically capable of increasing risk in susceptible individuals. It may be worth carefully reviewing the medication such individuals are taking, and assessing the risks and benefits of any changes to their regime.

MEDICATIONS LIKELY TO PROVOKE OR INCREASE THE SEVERITY OF HEATSTROKE		
Those causing dehydration or electrolyte imbalance	Diuretics, especially loop diuretics Any drug that causes diarrhoea or vomiting (colchicine, antibiotics, codeine)	
Those likely to reduce renal function	NSAIDs, sulphonamides, indinavir, cyclosporin	
Those with levels affected by dehydration	Lithium, digoxin, antiepileptics, biguanides, statins	
Those that interfere with thermoregulation:	by central action	Neuroleptics, serotonergic agonists
	by interfering with sweating	Anticholinergics <ul style="list-style-type: none"> <li>– atropine, hyoscine</li> <li>– tricyclics</li> <li>– H1 (first generation) antihistamines</li> <li>– certain antiparkinsonian drugs</li> <li>– certain antispasmodics</li> <li>– neuroleptics</li> <li>– disopyramide</li> <li>– antimigraine agents</li> </ul>
		Vasoconstrictors
		Those reducing cardiac output <ul style="list-style-type: none"> <li>– beta blockers</li> <li>– diuretics</li> </ul>
	by modifying basal metabolic rate	Thyroxine
<b>Drugs that exacerbate the effects of heat</b>		
by reducing arterial pressure	All antihypertensives Antianginal drugs	
<b>Drugs that alter states of alertness</b> (including those in section 4.4 of the British National Formulary)		

## Further information

### *The Heatwave Plan*

The full *Heatwave Plan* can be accessed on the Department of Health website at [www.dh.gov.uk/publications](http://www.dh.gov.uk/publications). It outlines the responsibilities of health and social care organisations at different stages during a heatwave.

### NHS Choices

NHS Choices at [www.nhs.uk](http://www.nhs.uk) can provide additional advice on heatstroke and other heat-related conditions.

### Information on alert levels

The heatwave alert levels will be triggered by temperature thresholds (see Annex 1 in the *Heatwave Plan*) set according to regional variations. Therefore the Met Office website ([www.metoffice.gov.uk](http://www.metoffice.gov.uk)) will be the first place where the alert level is available. The alert level will also subsequently be displayed on the Department of Health, Health Protection Agency and NHS Choices websites.

### Information on air quality

Regular updates on levels of particulate matter (PM10), sulphur dioxide, nitrogen dioxide, ozone and carbon monoxide are available on Teletext (page 156), and at [www.airquality.co.uk](http://www.airquality.co.uk) (Air Quality Archive), which also offers health advice to those who may be particularly sensitive to air pollution.

Additional information on air quality can be found from:

- the freephone Air Pollution Information Service  
telephone number [0800 55 66 77](tel:0800556677)
- Sky News Air Pollution bulletin  
(which normally airs in the evening around 18.45)

Advice to those with respiratory problems is consistent with the advice to all others during a heatwave – to keep windows shaded and closed when outside temperatures are hotter during the daytime to reduce heat (and ozone) entering the home; and opening windows at night or when it is cooler outside, to aid cooling of their home.

Ozone is the main air pollutant that affects respiratory symptoms and has a diurnal variation, peaking during the hottest period of the day and dropping to very low levels at night. Other air pollutants tend to be at lower levels indoors, and therefore the other main advice to those with respiratory problems is to restrict going outside, especially during the hottest period of the day.

### Sun protection

You can get advice on skin protection during hot weather from the Cancer Research UK SunSmart campaign website at [www.cancerresearchuk.org/sunsmart](http://www.cancerresearchuk.org/sunsmart).

## **ANNEXES**

### **Advice templates: examples**

**Annex 1: Advice card for district nursing/health visiting leader**

**Annex 2: Advice card for district nurse/health visitor**

**Annex 3: Advice for emergency planners**

## Annex 1: Card for district nursing/health visiting leader

National Heatwave Plan Alert Level	Commentary	Response required
<b>LEVEL 1</b> Summer preparedness	Long-term <b>planning</b> to protect vulnerable people during heatwaves. Readiness for the heatwave season (1 June–15 Sept).	<ul style="list-style-type: none"> <li>• Brief district nurses and health visitors (DNs/HVs) on the principles and core elements of the national Heatwave Plan.</li> <li>• Identify a list of clients at risk during a heatwave.</li> </ul>
<b>LEVEL 2</b> Alert and readiness	<b>National alert</b> that there is a 60 per cent chance of a heatwave in one English region – this normally occurs three days before the event.	If notified by emergency planning that level 2 conditions are triggered: <ul style="list-style-type: none"> <li>• contact DN/HVs and instruct them to prioritise their current list of clients at risk;</li> <li>• identify what non-essential activities could cease;</li> <li>• make provision for surge capacity; and</li> <li>• be prepared to attend a meeting of the heatwave sub-committee.</li> </ul>
<b>LEVEL 3</b> Heatwave action	Heatwave conditions in one region or more. A <b>heatwave</b> has been declared if the 'qualifying' temperatures are exceeded.	If notified by emergency planning that a heatwave has been triggered: <ul style="list-style-type: none"> <li>• use all available resources to maximise frontline DN/HV capacity. If this is not sufficient, notify emergency planning;</li> <li>• require DN/HVs to make daily contact with clients at risk and make a daily situation report;</li> <li>• collate situation reports and forward summary to emergency planners; and</li> <li>• be prepared to receive and utilise NHS volunteers.</li> </ul>
<b>LEVEL 4</b> Heatwave emergency	A heatwave emergency is when other sectors, not just the health sector, are affected during a prolonged or serious heatwave – a <b>major incident</b> will be declared locally where necessary.	<ul style="list-style-type: none"> <li>• Receive and utilise NHS volunteers.</li> <li>• Situation reports might be requested more frequently than once a day by emergency planners, who will be reporting to major incident partners.</li> </ul>

## Annex 2: Card for district nurse/health visitor

National Heatwave Plan Alert Level	Commentary	Response required
<p><b>LEVEL 1</b> Summer preparedness</p>	<p>Long-term <b>planning</b> to protect vulnerable people during heatwaves. Readiness for the heatwave season (1 June–15 Sept).</p>	<ul style="list-style-type: none"> <li>• Be familiar with the principles and core elements of the national Heatwave Plan.</li> <li>• Be familiar with the client heatwave advice leaflet and give copies to your clients as appropriate.</li> <li>• As clients come onto your caseload and are assessed, consider their vulnerability to adverse weather conditions, add them to your at-risk list and consider referring them to the local authority environmental health practitioner for an assessment on their health and housing, (HHSRS).</li> </ul>
<p><b>LEVEL 2</b> Alert and readiness</p>	<p><b>National alert</b> that there is a 60 per cent chance of a heatwave in one English region – this normally occurs three days before the event.</p>	<p>If notified by the district nursing or health visiting leader that level 2 conditions exist:</p> <ul style="list-style-type: none"> <li>• construct a prioritised list from your caseload of those who will require daily contact in the event of a heatwave. Some clients, especially the elderly, may be visited by more than one agency. During emergencies, when staff are stretched, agree where possible to avoid duplicate contact/visits; and</li> <li>• determine what non-essential activities could cease.</li> </ul>
<p><b>LEVEL 3</b> Heatwave action</p>	<p>Heatwave conditions in one region or more. A <b>heatwave</b> has been declared as the 'qualifying' temperatures are exceeded.</p>	<p>If notified by the district nursing or health visiting leader that a heatwave has been declared:</p> <ul style="list-style-type: none"> <li>• stop non-essential activities;</li> <li>• commence daily contact with clients at risk; and</li> <li>• make daily situation reports.</li> </ul>
<p><b>LEVEL 4</b> Heatwave emergency</p>	<p>A heatwave emergency is when other sectors, not just the health sector, are affected during a prolonged or serious heatwave – a <b>major incident</b> will be declared locally where necessary.</p>	<ul style="list-style-type: none"> <li>• Continue to do your best for your caseload.</li> <li>• Provide situation reports upwards, as requested, and raise any concerns you may have.</li> </ul>

## Annex 3: Card for emergency planners

National Heatwave Plan Alert Level	Commentary	Response required
<b>LEVEL 1</b> Summer preparedness	Long-term <b>planning</b> to protect vulnerable people during heatwaves. Readiness for the heatwave season (1 June–15 Sept).	<ul style="list-style-type: none"> <li>• Draw the attention of the local authority planning department to the national heatwave plan.</li> <li>• Include the national plan and local response as an agenda item for the emergency planning committee.</li> <li>• Copy the plan to:               <ul style="list-style-type: none"> <li>– hospital estates, including mental health trusts</li> <li>– health visiting lead</li> <li>– district nursing lead</li> <li>– community primary care lead</li> <li>– Macmillan nurse lead</li> <li>– pharmacy lead.</li> </ul> </li> </ul>
<b>LEVEL 2</b> Alert and readiness	<b>National alert</b> that there is a 60 per cent chance of a heatwave in one English region – this normally occurs three days before the event.	Determine whether there is a greater than 60 per cent chance of a heatwave occurring within your region within three days – if there is: <ul style="list-style-type: none"> <li>• notify leads listed above; and</li> <li>• consider calling a meeting of the heatwave sub-committee.</li> </ul>
<b>LEVEL 3</b> Heatwave action	Heatwave conditions in one region or more. A <b>heatwave</b> has been declared as the ‘qualifying’ temperatures are exceeded.	Determine whether heatwave conditions cover your geographical area – if they do: <ul style="list-style-type: none"> <li>• call a meeting of the heatwave sub-committee if one has not already been held; and</li> <li>• identify priority risks in the geographical area or populations to act upon.</li> </ul>
<b>LEVEL 4</b> Heatwave emergency	A heatwave emergency is when other sectors, not just the health sector, are affected during a prolonged or serious heatwave – a <b>major incident</b> will be declared locally where necessary.	<ul style="list-style-type: none"> <li>• Establish a multi-agency control group if one has not already been established.</li> <li>• Obtain regular situation reports from frontline healthcare leads.</li> <li>• Public Health to advise partners of wider health risks to the population.</li> <li>• Provide updates, and report any concerns to regional resilience teams.</li> </ul>



© Crown copyright 2010  
301461/B 2ap May10  
First published July 2004  
Updated May 2010  
Produced by the Department of Health

This title can also be made available on request  
in Braille, in audio, on disk and in large print.

[www.dh.gov.uk/publications](http://www.dh.gov.uk/publications)