

# Heatwave: Fact Sheet for Clinicians



Prolonged periods of extreme heat can have serious impacts on at-risk members of the community. Clinicians, particularly those in general practice, emergency departments and pharmacies, have a key role in preventing and managing heat-related illness.

## Definition of a heatwave

A heatwave is a period of unusual and uncomfortable hot weather that can impact on human health, causing illnesses such as heat cramps, heat exhaustion and heatstroke, which may be fatal.

Heatwaves rarely occur in isolation. Infrastructure failure or other natural emergencies can add stress on people and services. For example, power outages stop people using air conditioners; bushfires increase vulnerability by reducing air quality; and public transport disruptions prevent people from reaching a cooler location.

## How the body is affected by heat

### Regulation of body temperature

- The body can lose heat to, and gain heat from, the environment.
- Heat loss is controlled by the flow of blood to the skin and evaporation of sweat.
- When the environment is hot, sweating is the only means by which the body can lose heat.
- Sweating and heat loss can be impaired by humidity, excess fat, skin disorders and excessive layers of clothing. Heat loss can be helped by wind or fanning and water.

### Dehydration

- It is possible to sweat up to 15 litres per day.
- Thirst does not match all fluids lost by sweating, even if fluids are freely taken.
- Mild to moderate dehydration increases cardiac work and reduces fluid available for sweating.
- Even mild dehydration is associated with increased risk of injury, heat stress illness and poorer performance of complex tasks.

## Heat-related illness

Some illnesses or conditions can occur as a direct result of excessive heat, such as heat rash, cramps, exhaustion, heat stroke and exertional heat stroke. Most importantly, heat may exacerbate existing medical conditions such as heart disease.

The most common causes of death during heatwaves are **cardiac, asthma** and other **respiratory illness, kidney disease, diabetes, nervous system diseases** and **cancer**.

Although heat cramps, heat exhaustion and heat stroke may occur, other conditions are more commonly presented to clinicians and may not be recognised as heat-related.

These conditions may be exacerbated by dehydration and subsequent medication toxicity:

- **altered mental state**
- **urolithiasis**
- **cardiovascular impairment**
- **falls**.

The following may occur due to heatwaves:

- **asthma** and other **respiratory illness**, due to ambient air pollution
- **gastroenteritis**, mostly due to poor food handling and storage.

# Background

## Direct heat-related illnesses

Disorder	Cause	Symptoms
Heat rash	Inflammation of the sweat glands	Erythematous papular rash, pruritis, secondary infection
Heat cramps	Loss of salt in sweat affects muscle relaxation	Spasms in the abdomen, arms or legs
Heat exhaustion	Dehydration with poor blood flow affecting the brain and heart	Flushed or pale complexion & sweating, tachycardia, muscle cramps, weakness, dizziness, headache, nausea, vomiting, syncope
Exertional heat stroke	Core temperature rise precipitated by intense or prolonged exercise in hot weather	As for heat stroke, plus rhabdomyolysis, renal failure
Heat stroke	Core temperature rise with widespread organ injury	As for heat exhaustion, plus hyperthermia, shock, arrhythmia, dry skin with no sweating (skin may be damp from earlier sweat), altered mental state, ataxic gait, convulsions, unconsciousness, death

## Medication and hot weather

Some prescribed medications can increase the risk of heat-related illness or may be less effective or more toxic when exposed to high temperatures. Most drugs need to be stored below 25°C, particularly emergency drugs such as antibiotics, adrenergic drugs, insulin, analgesics and sedatives. Care planning for vulnerable people during hot weather should include consultation with their GPs and pharmacists about the use and storage of medications.

## Mechanisms for medication increasing the risk of heat-related illness

Mechanism	Examples
Reduced vasodilation	Beta-blockers
Decreased sweating	Anticholinergics e.g. tricyclic antidepressants and benzotropine, beta blockers, antihistamines, phenothiazines
Increased heat production	Antipsychotic drugs e.g. risperidone and olanzapine, amphetamines, cocaine, thyroxine
Decreased thirst	Butyrophenone e.g. haloperidol and droperidol, angiotensin-converting enzyme (ACE) inhibitors
Dehydration	Diuretics, Alcohol
Aggravation of heat illness by worsening hypotension in vulnerable patients	Vasodilators, e.g. nitrates (GTN) and calcium channel blockers, anti-hypertensives
Increased toxicity for drugs with a narrow therapeutic index in dehydration	Digoxin, lithium, warfarin

## Prevention and mitigation

### Educate and inform

Whenever you see an at-risk patient, take the opportunity to educate them to manage their health during hot weather. Give them a brochure and stress that they need to stick to the recommendations. Advise them on how to adjust their behaviour, store and take medication and fluids during hot weather. Give them the details of social and medical services, helplines and emergency services.

### At risk groups

Individual characteristics	Over the age of 65, infants and young children, overweight or obese, pregnant and breastfeeding mothers, low cardiovascular fitness
Chronic illness	Heart disease, high blood pressure, diabetes, cancer or kidney disease alcohol and other substance use, mental health problems
Conditions that impair sweating	Heart disease, dehydration, extremes of age, skin disorders (including sunburn, prickly heat and extensive scarring from burns), congenital impairment of sweating, cystic fibrosis, quadriplegia, scleroderma, people taking medications with anti-cholinergic effects
Acute illness	Dehydration, infection
Impairment of activities of daily living	Poor mobility, cognitive impairment
Social factors	Live alone or socially isolated, low socioeconomic status, homeless
Occupation/recreation	Exercising vigorously in the heat

# Planning

## Pre-heatwave clinical planning

### Review your knowledge

- Understand the mechanisms of heat illnesses, clinical manifestations, diagnosis and treatment.
- Recognise early signs of heatstroke, which is a medical emergency.
- Be aware of how to initiate proper cooling and resuscitative measures.
- Be aware of the risk factors in heat-related illness.

### Review your patients

- Identify patients at risk and educate them about heat illnesses and prevention.
- Educate carers of children, older people and people with cognitive impairment or disability.
- Include a pre-summer medical assessment and heat advice into routine care for people with chronic disease (reduction of heat exposure, fluid intake, medication).
- Be aware of potential side effects of medicines and adjust dose if necessary.
- Be aware that high temperatures can adversely affect the efficacy of drugs.
- Make decisions on an individual basis (there are no standards for alteration in medications during hot weather).
- Monitor drug therapy and fluid intake, especially in the older people and those with advanced cardiac diseases.
- Encourage appropriate behaviour such as reducing excessive clothing, using cooling devices at home and discourage avoidance of fluids due to continence issues.

### Review your practice and systems

- Appoint a person responsible for planning a heatwave response.
- Hold team meetings to discuss the practice response to a heatwave, develop a written policy, review the practice triage policy and conduct yearly heatwave meetings prior to summer to refresh practice staff.
- Develop and implement a communication policy to keep staff updated if a heatwave is forecast.
- Keep in contact with the local Divisions of GP for communication from the Chief Health Officer.
- Ensure Divisions of GP and RACGP are in contact with the Department of Health so that latest resources and alerts are distributed in timely manner.
- Ensure the practice is heatwave-friendly for patients and staff with a cool waiting room, water available, blinds closed to block the sun and staff breaks for drinks.
- Have phone numbers of key resources within easy access—emergency departments, local HACC services, RDNS and website of Department of Health heatwave resources.
- Have up-to-date heatwave take home resources for patients and their carers.
- Have a plan in case power goes out, for example what to do with vaccine fridges.
- Consider adding a question on the over 75 health assessment that asks a patient to consider their personal care during a heatwave.
- Think about heatwave planning for all vulnerable groups when writing GP Management Plans.
- Remember the practice is a community service which may have additional responsibilities during a heatwave.
- Plan for staff shortages, for example, if there is a code red or bushfire alert or the GP is also the VMO.
- After the heatwave, have an evaluation meeting with staff to discuss how they dealt with it, what went well, what needs improvement and provide feedback to the Division of GP.



## Drinking recommendations

During hot weather, people need to drink even if they are not thirsty. Each older person or patient needs to receive personalised drinking recommendations depending on their health status, particularly those who have a decreased perception of thirst. Carers also need to maintain adequate hydration.

Fluids are not just limited to water; they can be icy poles, weak tea or cordial. Salt tablets, sports drinks or electrolyte-carbohydrate supplements offer no benefits and may be harmful because of high osmotic load. Excessive drinking of pure water can lead to severe hyponatraemia, potentially leading to complications like stroke and death.

## Considerations in managing heat-related illness

### Assessment

- history (exposure, vulnerabilities and comorbidities, fluid intake/output, medications, psychosocial)
- examination (vital signs, conscious state, skin, hydration status)
- investigations (FBE, U+Es, CK, urinalysis, urine/serum osmolality, glucose, acid-base balance, ECG, septic screen if indicated, consider uric acid, TFTs, CT brain etc.)

### Treatment

- fluids (oral vs. IV, caution in hyper/hyponatraemia due to risk of osmotic demyelination syndrome)
- cooling
- supportive (eg. benzodiazepine for seizures, analgesia, antiemetics, anti-arrhythmics as indicated)
- observation

### Discharge/Disposition

- home environment (home temperature, cooling facilities etc.), supports, follow-up
- low threshold for admission to hospital/referral to ED/urgent respite placement in vulnerable communities.

## Contacts and resources

### Emergency Respite

- Commonwealth Respite and Carelink Centre: Careline 1800 052 222 (Business Hours) or 1800 059 059 (After-Hours Emergency Respite)
- Veterans' Home Care Agency assessment service: 1300 550450 (Business Hours) (for emergency after-hours respite call Careline above)
- Annecto Emergency After-Hours Response Service (Victorian) 1800 72 72 80 (5pm–9am weekdays, 24 hours weekends and public holidays). Free short term personal care, respite crisis management, telephone and in home support for older people, people with disability or carers who do not have funded assistance.
- Local governments often provide respite services.

**Nurse-on-Call**— 24 hour health advice 1300 60 60 24

**Heatwave community information resources** (Victorian Government Health Information)—community information to support people to take care of themselves, family, friends and neighbours in the heat. Available in community languages. <http://www.health.vic.gov.au/environment/heatwave>

\* This resource was produced by a working group from the Australian College of Emergency Medicine (Public Health Committee), General Practice Victoria and the Royal Australian College of General Practitioners.