Australasian College
for Emergency Medicine

Heatwave and heat health

Policy P59

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Document Review

Timeframe for review:	Every three years, or earlier if required
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Revision History

Version	Date	Pages revised / Brief Explanation of Revision
01	Jul-05	Approved by Council
02	March-12	Approved by Council Template updated. Change to content under 'Purpose and Scope'. Slight change to some of the content under 'Procedure and Actions'
03	July-16	Approved by CAPP 'Definitions' added. 'Introduction' added 'Policy' expanded in order to discuss approaches and tools that can be applied by emergency physicians when treating those experiencing FDVA 'Procedure and Actions' expanded to include skills and resources required
04	July-20	Substantial revision throughout Application of new document style Limitation of policy to Australian EDs

Related documents

ACEM Environmental Strategy

P33 Policy on Emergency Department Disaster Preparedness and Response

S68 Position Statement on Climate Change and Health

ACEM Heat Health Resource for Emergency Departments

1. Purpose and scope

This document is a policy of the Australasian College for Emergency Medicine (ACEM) and relates to the preparation, readiness and responsiveness of emergency departments (EDs) and emergency medicine systems to environmental heatwaves and extreme heat events.

The Policy is applicable to all EDs in Australia and New Zealand, and ED clinicians.

2. Definitions

Heatwave

There is no universally accepted definition of heatwave as it is geographically-specific, and jurisdictions use different thresholds to trigger the release of heat health alerts. Local circumstances such as overnight temperatures, humidity, pollution, demographics, urban heat island effects, specific difficulties faced by rural communities, and acclimatisation are some of the factors which contribute to the defined severity and impact of a heatwave event.[1,2]

The World Meteorological Organization (WMO) defines a heatwave as "a marked unusual hot weather (max, min and daily average) over a region persisting at least two consecutive days during the hot period of the year based on local climatological conditions, with thermal conditions recorded above given thresholds".[3]

In Australia, the Bureau of Meteorology (BoM) defines a heatwave as when there are three or more consecutive days with minimum and maximum temperatures that are unusually hot for a particular location. The BoM classifies heatwaves according to three intensity levels: Low; Severe; and Extreme.[4] While New Zealand (NZ) does not yet have a formal definition, the New Zealand government recently issued heat health guidelines based on the WMO definition.[5]

Excess Heat Factor metric

Due to the lack of consensus about what characterises a heatwave event, the Excess Heat Factor (EHF) metric was developed in Australia to monitor and forecast heatwave intensity. It is based on the need to measure both minimum and maximum temperatures to assess intensity and provides an index of the combined effect of excess heat and heat stress.[6] Since 2014, the EHF has been used by the BOM in Australia to publicly release seven-day heatwave severity maps and is now being used internationally as part of heatwave warning systems.[7,8]

3. Background

Heatwaves have only relatively recently been recognised as a threat to environment and society in contrast to other extreme climate events.[2] However, they are a significant cause of morbidity and mortality and have caused more deaths in Australia over the past 100 years than any other natural hazard.[9] They can severely impact community infrastructure and services, e.g. power outages and transport disruptions, leading to wide-ranging problems in supply chain and resource security. These events can therefore result in decreased resource capacity with conversely increased and prolonged surge demand on emergency medical systems requiring a disaster management response.[10]

According to the WMO, 2015-2019 was the warmest five-year period on record globally, with a global temperature increase of 1.1 degrees Celsius since the pre-industrial period.[11] Global climate change science predicts that extreme weather events will occur with increasing frequency due to temperatures rising, in addition to an overall warming of the environment.[12] Therefore heatwave events are likely to become more common, more severe and more protracted over time[13] This means heatwaves may cause slow burn disasters as well as contributing to acute surges in demand. Furthermore, extended periods of above average temperatures have been shown to contribute to other public health emergencies such as the unprecedented bushfire season of 2019-2020 and increases in air pollutants.[14,15]

Health effects of heatwave encompass direct and (more commonly) indirect heat-related illness as a risk multiplier for complications from co-morbid disease, alteration of medication action and efficacy, psychological distress and infectious diseases outbreaks (often due to changes in vector distribution).[16]

Population groups at greater risk of adverse health effects from heatwave commonly attend EDs and include people at extremes of age (>65 yrs., infants and small children); living with chronic medical illnesses including overweight and obesity; with physical or cognitive disabilities, diagnosed with a mental illness; experiencing social isolation, including culturally and linguistically diverse (CALD) communities; experiencing social disadvantage and homelessness; who use alcohol and other drugs; outdoor workers; and pregnant and breastfeeding mothers.[16,17] Urban populations are at risk due to the Urban Heat Island Effect (UHI effect) but non-urban populations are also at risk, particularly during periods during and after unusually hot weather.[18] With an ageing population, the impact of heatwaves is also likely to increase in future.

4. Policy

Heatwaves can impact community infrastructure and service dysfunction (such as power outage and transport breakdown). This can lead to a surge demand on emergency medical systems and therefore require a disaster management response.

EDs are one stakeholder of what should be a whole of society Heat Health Action Policy (HHAP). This should encompass: Heat Health Warning Systems (HHWS); general public education and awareness raising about heat; preparedness in terms of specific training of stakeholders in, and responders to, periods of extreme heat; specific guidance on actions to reduce personal levels of heat risk; clear guidance on heat-risk governance and responsibility for the implementation of a range of strategies and the maintenance of critical hard and soft infrastructure (for example, air-conditioning in care homes and social/support networks); a plan outlining "the when, what, how and to whom" in relation to heat-related messages; a programme of evaluation in terms of whether the HHWS and HHAP are achieving their aims; a real-time health-surveillance system; advice on longer-term strategies for reducing heat risk, such as through climate-sensitive building, urban design and town planning; and monitoring and evaluation of the effectiveness of interventions and how they could be improved.[18]

Resources and vulnerability to heat related illness is usually geographically specific. It is therefore the responsibility of respective jurisdictional health and disaster planning authorities to manage the effects of heat wave periods. However, EDs are well placed to assist in pre-heatwave preparedness by identifying at-risk patients and providing education and interventions as appropriate. EDs also play an important role in the emergency medicine system response to heatwave induced surge demand.

5. Procedures and actions

5.1 Preparedness/Planning

- EDs should actively participate in heatwave preparedness, including disaster simulation both throughout the warmer months and also when heatwave events are forecast. Additional resources to manage both the increase in demand and the range of clinical presentations associated with heat exposure should be provided to EDs by the relevant organisations.
- ED staff should be provided with training in and understand: the extensive direct and indirect health effects of heatwave; heat illness thermoregulation/physiology; risk-factors, at-risk groups and factors increasing population vulnerability; presentation and management; and adverse effects of medications in hot weather.
- Given projections for protracted, increasingly severe and frequent heatwaves, consideration should be given to pre-emptive long-term financial planning to increase capacity in emergency response services on an ongoing basis, rather than as a response to isolated episodes of heatwave.
- Emergency physicians should be involved in public health planning for heatwave and work collaboratively with other stakeholders such as government services, community healthcare providers, pre-hospital services and general practitioners. Planning should incorporate educational public health interventions as well as action plans for demand surge responses during heatwave.
- ED plans should consider the involvement of public health units, primary care networks, social work and aged care services, community nursing services, and transport services
- It is strongly recommended that a Fellow of ACEM (FACEM) be assigned heatwave planning either as a specific portfolio duty, or as part of responsibility for overall disaster planning. The FACEM with responsibility for heat health should know how the ED will be notified of a heatwave or heat health alert from central authorities as well as how any such notification will be disseminated to ED clinicians
- Emergency physicians should use clinical opportunities during care delivery or at discharge from the ED to educate and inform patients and their carers about mitigation of adverse health effects from heatwave, including advice about medication alteration and storage, fluid intake and maintaining a cool and safe environment. Safety netting procedures should be emphasised.
- Consider giving all patients with chronic disease and/or age >65 years a medication review and advice about withholding medications that may increase risk of heat illness in the days preceding and during a Heat Health Alert.
- Emergency physicians should identify vulnerable patients e.g. the elderly, infants, socially isolated (including CALD communities) and disadvantaged, outdoor workers, those with comorbidities and consider the effects of heat stress when planning disposition from the ED during a heatwave.
- Educational and informative material regarding maintaining health and safety during a heatwave should be made accessible to patients and their carers attending the ED, including poster displays and promotion of online resources.

5.2 Response

- Hospitals should have a heatwave response plan that reflects the increased capacity requirements as well as the multidisciplinary and multiagency service response requirements that occur during a heatwave. This plan should be integrated with existing emergency and all hazard disaster response planning arrangements and treated as a whole-of-health service emergency.
- EDs should play a central role in the clinical and systems response to a demand surge for acute medical care as a result of heatwave.

- Emergency physician expertise in clinical care, prioritising treatment and managing and organising medical services should be recognised and reflected in hospital-wide and health system-wide responses to heatwaves.
- EDs should be cool and safe environments for staff and patients and drinking water should be available.
- EDs should be stocked with appropriate equipment for the treatment of heat illness, including ice, fans, water spray bottles and cooling blankets.
- Classic non-exertional heat stroke (NEHS), which is more common than exertional heat stroke, is characterised by hyperthermia, anhidrosis, and an altered sensorium, which develop suddenly after a period of prolonged elevations in ambient temperatures (i.e. heat waves). Core body temperatures greater than 41°C are diagnostic, although heatstroke may occur with lower core body temperatures. Most of the excess presentations will be triggered by dehydration causing decompensation and aggravation of chronic disease. Most cases of heat illness seen in the ED will be non-exertional in nature and may occur alone or in combination with worsening of chronic disease.
- As heatwaves can affect multiple EDs (e.g. whole cities/regions/states), emergency physicians should take a pivotal role in communication with colleagues, in other EDs, hospitals and with central coordinating bodies, to provide information on activity, demand, capacity and resource requirements in order to ensure a functional system-wide response.

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