Acute Care During Extreme Heat

Recommendations and Information for Health Care Workers

Recognize Heat Illnesses and Heat Sensitive Diseases

- **Heat exposure can result in direct illnesses including:** Heat Edema, Heat Rash, Heat Cramps, Heat Syncope (fainting) and Heat Exhaustion. These can be self-limiting, but should always be addressed with treatment.
- Exertional Heat Stroke and Classic Heat Stroke are **medical emergencies** and require immediate action from a health care worker and hospitalization.
- Exposure to heat may also present as exacerbation of Cardiovascular, Renal, Pulmonary or Psychiatric illnesses.

Key Actions

- Recognize and identify heat as a factor in illness or death.
- Recognize Heat Stroke, and activate emergency medical services.
- Record heat as a contributing factor to illness for improved recognition and monitoring.

Signs and Symptoms of Heat Exhaustion and Heat Stroke

(Terms in bold are key diagnostic factors)

	Heat Exhaustion	Heat Stroke
Temperature	**Core temperature elevated but <40°C (104°F)**	**Core temperature ≥ 40°C (104°F)**
Neurological	• Anxiety and confusion • Dizziness and light-headedness • Headache	**Mental status changes:** • Delirium/hallucinations • Ataxia (lack of coordination indicating neurological dysfunction) • Confusion, irritability, emotional instability, aggressiveness, seizures • Loss of consciousness
Cardiac	• Tachycardia	• Cardiac arrhythmias and tachycardia
Skin	• Cutaneous flushing (hot, red skin) • Sweating present	• **Classic Heat Stroke: hot, red, dry skin** typically affects sedentary vulnerable people • **Exertional Heat Stroke: profuse sweating** typically associated with high physical activity
Other	• Nausea, vomiting • Hypotension	• Shock • Tachypnea
Outcome	Untreated and with ongoing heat exposure, heat exhaustion can worsen and become heat stroke.	In later stages, pulmonary edema, hepatic failure, renal failure, rhabdomyolysis (muscle fibre breakdown), death

Key Risk Factors Associated with Heat-Related Illnesses and Death in Extreme Heat

Older adults

Those having chronic diseases including:

Cardiovascular disease (hypertension, coronary artery disease, heart conduction disorders)

Mental and behavioural disorders (due to psychoactive substance use, alcoholism)

Mental illness (dementia, depression, schizophrenia, Alzheimer's)

Living circumstances (confined to bed, social isolation, reduced income, malnutrition, reduced access to cooling options)

Neurological disease (Parkinson's disease)

Respiratory illness (chronic obstructive pulmonary disease (COPD), asthma)

Renal disease (renal failure)

Metabolic conditions (diabetes, obesity)

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Some Medications that Increase the Health Risks from Extreme Heat

Medication	Mechanism
Antiadrenergics and β-Blockers (e.g. Atenolol, Metoprolol)	Can decrease cardiac output, and therefore shunting of warm blood from body core to periphery, limiting cooling.
Anticholinergics (e.g. Scopolamine)	Can prevent sweat glands from functioning properly (i.e. inhibit rate of sweating and therefore rate of cooling).
Antidepressants (e.g. Prozac, Zoloft, other SSRIs)	Many have anticholinergic properties (see above) and some can raise the brain's thermal set-point decreasing centrally induced thermoregulation. SSRIs can increase the risk of hyponatremia.
Antihistamines (e.g. Brompheniramine)	Can inhibit the sweating mechanism.
Anti-Parkinson's agents (e.g. Benztropine, Levodopa, Trihexyphenidyl)	Can inhibit the sweating mechanism.
Antipsychotics (e.g. Olanzapine)	Can inhibit the sweating mechanism. Can induce a hyperthermic syndrome (neuroleptic malignant syndrome) on their own, which would be compounded by the effects of heat.
Sympathomimetics (e.g. Pseudoephedrine)	Can prevent dilation of the blood vessels in the skin of the periphery (hands, feet, face) reducing the ability to dissipate heat by convection.
Diuretics (e.g. Lasix)	Can lead to dehydration and hyponatremia is a common side effect.
Several drug classes (e.g. cholinesterase inhibitors, antiarrhythmics, calcium blockers)	Can provoke diarrhea and/or vomiting, leading to dehydration.

Key Actions to Address Risk Factors

- Educate and increase awareness of the risk factors, signs and symptoms and treatment for heat illnesses, both for patients, care givers and health care workers.
- Help patient assess their risk and discuss preventive actions they could take to reduce risks before and during extreme heat events. *(Refer to the Health Canada's Heat-Health Fact Sheet Series)*

Treatment Priorities

Cool and Hydrate

- Heat stroke is a medical emergency and requires hospitalization.
- **Cool the body early, monitor vital signs.** This can prevent later stage damage and death.
  Exertional heat stroke –cool quickly with ice-water baths.
  Classic heat stroke –more often occurs in people with other chronic conditions.
- Treat dehydration.
- Check for over-hydration, hyponatremia, especially in athletes; assess patient's recent physical activity.

For additional information refer to Health Canada's Extreme Heat Events Guidelines: Technical Guide for Health Care Workers

For further information email: Climatinfo@hc-sc.gc.ca

For more information in your region:

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