

Medi Quest BRS Hospital

A monthly News letter from BRS Hospital

HEAT RELATED ILLNESS PART 2 HEAT STROKE

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To be continue last issue...

TREATMENT

EXERTIONAL HEAT STROKE-

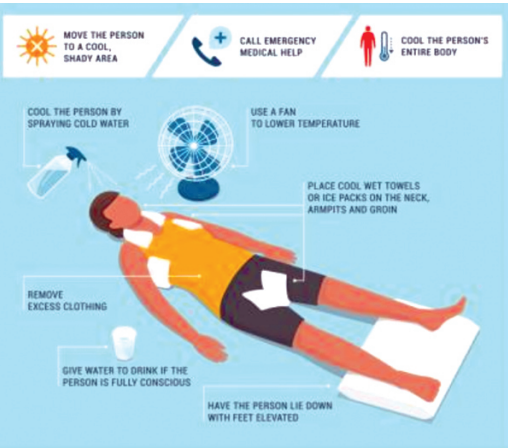
Immersion in cold water is the accepted method of choice for achieving a cooling rate of 0.20° to 0.35°C per minute



Packing ice cubes inside an impermeable blue bag (body bag) and placing the patient in it is also a method of ice immersion which has been used

Where ice is not readily available , a cooling rate of 0.1°C per minute can be achieved by pouring copious amount of water over the body with fanning

CLASSIC HEAT STROKE- use of conductive or evaporative cooling, such as infusion of cold fluids (intravascular temperature management); application of ice packs, cold packs or wet gauze sheets and fanning



ON SITE:

CPR- Perform according to ACLS

protocol; administer oxygen at 4 liters/min to increase oxygen saturation to >90%

CORE BODY TEMPERATURE- Monitor rectal temperature and perform cooling in cases of hyperthermia

FLUIDS- Administer isotonic saline IV (1–2 liters/hr)

SEIZURE MEDICATION- Administer benzodiazepines IV (5 mg) until seizures cease

EMERGENCY DEPARTMENT:

MONITOR CIRCULATION- administer fluids (30 ml/kg), monitor CVP, maintain mean arterial pressure at >65 mm Hg and urine output > 50 ml/hr or 2ml/kg/hr

CORE BODY TEMPERATURE- Monitor rectal or intravesical temperature and perform cooling until core temperature <38.0°C; use either a cooling suit or cold fluids (4°C, 1000 ml/30 min) infused through central catheter; antipyretics are toxic and should be avoided

SEIZURE MEDICATION- benzodiazepines IV (5 mg, repeated)

LABORATORY TESTING- Perform CBC, urinalysis, blood cultures, kidney-function and liver-function tests (ALT, AST, ammonia, INR); test for glucose, electrolytes, arterial blood gases and acidbase balance, clotting function, CK, LDH, myoglobin, CRP

INTENSIVE CARE UNIT:

General -Perform CPR according to ACLS protocol. Monitor rectal temperature; continue cooling to maintain core temperature at <38.0°C by infusing cold fluids (4°C, 1000 ml/30 min) through central catheter. antipyretics are toxic and should be avoided

Perform laboratory tests: CBC, glucose, arterial blood gases and acidbase balance, clotting function, CK, LDH, liver function (ALT, AST, ammonia, INR), myoglobin, kidney function, urinalysis, CRP, blood cultures

Heart failure- Perform CPR according to ACLS protocol; perform invasive hemodynamic monitoring and echocardiography;

Acute kidney injury- Administer crystalloid solution to maintain urine output 2ml/kg/hr

Encephalopathy and brain edema- For a score of <8 on the GCS, intubate and ventilate. mannitol 20% IV (0.252 g/kg in 30 min), keep head at 45-degree angle, administer tranquilizers

Rhabdomyolysis -Administer IV fluid infusion, 12 liters/hr (aggressive fluid treatment in the first hour). sodium bicarbonate, 30 mmol/hr (to achieve urine pH >6.5); myoglobinuria is expected

DIC and other coagulation abnormalities

For bleeding and thrombosis, administer fresh-frozen plasma (bolus dose, 1015 ml/kg, then 200400 ml according to coagulation indexes)

Platelet concentrates (infusion of one therapeutic dose) if platelet count <20 per mm³

ARDS Perform intubation and mechanical ventilation

Liver failure Monitor liver function and mental status for at least 4 days . N-acetylcysteine IV (bolus dose, 150 mg/kg in 200 ml of 5% glucose solution for 20 min, then 50 mg/kg in 500 ml of 5% glucose solution for 4 hr, then 100 mg/kg in 1000 ml of 5% glucose solution for 16 hr

ECG Monitor continuously for possible arrhythmias

SIRS Treat the same as sepsis; consider antibiotics

HEAT EXHAUSTION

Heat exhaustion is a less severe heat-related illness, characterized by symptoms like dizziness, headache, and nausea, often accompanied by heavy sweating and cool, clammy skin. It occurs when the body loses too much water and salt, typically from sweating and struggles to regulate its temperature.

Occurring due to Strenuous exercise in high ambient temperature and humidity

The clinical criteria for heat exhaustion:

Athlete has obvious difficulty continuing with exercise.

Core body temperature is usually 101 to 104°F (38.3 to 40.0°C) at the time of collapse.

Heat exhaustion is characterized by the inability to maintain adequate cardiac output due to strenuous physical exercise and environmental heat stress

Patients with heat exhaustion manifest:

Tachycardia and hypotension, Extreme weakness, Dehydration and electrolyte losses, Headache, Abdominal cramps, nausea, vomiting, diarrhea,

Persistent muscle cramps

No significant dysfunction of the central nervous system is present. This is the key difference from exertional heat stroke.

If any central nervous system dysfunction develops (eg, mild confusion, Ataxia and coordination problems, light-headedness,), it is mild and resolves quickly with rest and cooling.

TREATMENT FOR HEAT EXHAUSTION

Move the patient to a shaded or air-conditioned area.

Place the patient supine with their feet elevated above the level of their head (raise their legs).

Remove excess clothing and equipment.

Cool the patient until their rectal temperature is approximately 101°F (38.3°C).

Rehydrate the patient with IV Fluids as needed

Continuously observe and frequently monitor heart rate, blood pressure, respiratory rate, rectal temperature, and mental status.

Key Differences between Heat Exhaustion and Heat Stroke

	Heat Exhaustion	Heat Stroke
Pathogenesis	Reduced Cardiac Output due to loss of fluid and electrolytes . Thermo regulatory functions are still working	Break down of Thermo regulatory function
Temperature	Temp 101 to 104°F	Temp above 104.9 ° F
CNS Changes	Absent to mild CNS changes	Severe CNS changes always present and is the key differentiating feature
Management	Responds to cooling and IVF	Needs ICU care and high risk of mortality

PREVENTION

Staying in air-conditioned environment , using fans, taking frequent cool showers, decreasing exertion, hydration



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