

A. Hyperthermia

OVERVIEW:

Hyperthermia is a world-wide problem that is likely to increase as the global environment continues to warm. While the ambient environment may be the major factor in an increasing number of temperature-related illnesses, other causes of hyperthermia may be more difficult to detect. The human body continually works to keep things in balance. Maintaining an even core body temperature is a major component of homeostasis; all of the critical bodily functions operate most efficiently at normal body temperature, which ranges from 36.5 to 37.5 C (97.7-99.5 F). The body generates most of its heat from metabolic processes in deep organs such as the liver, heart and brain, as well through small musculoskeletal contractions.

Initial Assessment

EMR / BLS

1. Care should be directed at supporting vital signs. Follow the appropriate protocol. Follow Initial Assessment/Care (**Protocol 1**).
 - a. Support life-threatening problems associated with airway, breathing, and circulation.
 - b. Administer oxygen, to maintain SPO2 \geq 94%. Support respirations as necessary with a BVM.
2. Assess past medical history and nature of illness (NOI):
 - Medications
 - Exposure to increased temperatures, humidity
 - Extremes of age
 - Extreme exertion
 - Time, length of exposure
 - Poor oral intake
 - Fatigue, muscle cramping
3. Signs and Symptoms:
 - Altered mental status
 - Unconsciousness
 - Hot, dry, or sweaty skin
 - Pale, clammy skin
 - Hypotension, shock
 - Seizures
 - Nausea
 - Weakness, dizziness, syncope
 - Rapid, shallow respirations
4. Remove the patient from the hot environment to a cool environment. Do not allow the patient to shiver with cooling techniques.

5. **Heat Cramps:** Signs and symptoms include muscle twitching, followed by painful spasms, especially involving the lower extremities and abdomen, nausea and vomiting, weakness and diaphoresis.

Treatment:

- a. PO fluids may be given as long as the patient maintains a patent airway and is not vomiting.

ALS

6. **Heat Exhaustion:** Signs and symptoms include: pallor, profuse sweating, hypotension, headache, weakness, fatigue and thirst.

Treatment:

- b. Establish an IV of Normal Saline.
- c. PO fluids may be given as long as the patient maintains a patent airway and is not vomiting.
- d. If patient's systolic B/P <90 mmHg administer a **fluid bolus up to 1000mL of NS**. Monitor B/P and lung sounds often.
- e. If the patient develops signs and symptoms of fluid overload respiratory distress (dyspnea, crackles, rhonchi, decreasing SpO₂), slow the IV to KVO.
- f. Place on cardiac monitor and perform a 12 lead ECG.

Transport patient ALS to the closest appropriate facility.

7. **Heat Stroke:** Signs and symptoms include: *altered mental status*, increased body temperature, minimal or no sweating, collapse, shortness of breath, shock, nausea and vomiting.

Treatment:

- a. Remove the patient's clothing.
- b. Establish an IV of Normal Saline.
- c. Do *not* give anything by mouth.
- d. Spray the patient's skin with a lukewarm water mist and fan the patient. Continue misting and fanning during transport.
- e. Wrap the patient with wet sheets if there is good ambient airflow present.

- f. Administer a **fluid bolus up to 1000mL of NS**. Monitor B/P and lung sounds often. If the patient develops signs and symptoms of fluid overload respiratory distress (dyspnea, crackles, rhonchi, decreasing SpO₂), slow the IV to KVO.
- g. Place on a cardiac monitor and perform a 12 lead ECG.

Transport patient ALS to the closest appropriate facility.

B. Hypothermia

OVERVIEW:

Hypothermia is typically defined as a core temperature less than 35° Celsius / 95° Fahrenheit. While most commonly seen in cold climates, it may develop without exposure to extreme environmental conditions. Hypothermia is not uncommon in temperate regions and may develop indoors even during summer. Hypothermia should be considered in any patient with an altered level of consciousness in a cool and /or wet environment. Individuals at the extremes of age and those of altered mental status are more susceptible to developing hypothermia. Vasoconstriction and bradycardia may cause extreme difficulty while attempting to palpate a pulse. Radiation accounts for the greatest form of heat loss. Conduction normally accounts for a much smaller amount, but increases significantly in wet clothes and astronomically in cold water. In patients that are hypothermic, pulse and respiratory rates may be slow or difficult to detect. If the hypothermic victim has no signs of life, begin CPR without delay.

Initial Assessment

EMR / BLS

1. Care should be directed at supporting vital signs. Follow the appropriate protocol. Follow Initial Assessment/Care (**Protocol 1**).
 - a. Support life-threatening problems associated with airway, breathing, and circulation.
 - b. Administer oxygen, to maintain SPO₂ ≥94%. Support respirations as necessary with a BVM.
2. Past medical history:
 - Medications
 - Exposure to environment even in normal temperatures
 - Exposure to extreme cold
 - Extremes of age
 - Drug use: alcohol, barbiturates
 - Infection, sepsis
 - Length of exposure, wetness
3. Signs and Symptoms:
 - Cold, clammy

- Shivering
- Mental status changes
- Extremity pain, sensory abnormality
- Bradycardia
- Hypotension, shock

4. Treatment

HYPOTHERMIA WITH a perfusing rhythm (pulse):

EMR/BLS

1. Prevent additional evaporative heat loss by removing wet garments and insulating the victim from further environmental exposures.
2. Initiate passive rewarming with blankets and a warm environment.
3. Perform procedures gently. These patients are prone to develop ventricular fibrillation.

ALS

4. Start an IV of Normal Saline KVO (**Procedure 13**).
5. Monitor and perform a 12 lead ECG.

HYPOTHERMIA WITHOUT a perfusing rhythm (pulse):

EMR/BLS

6. Begin CPR immediately (**Protocol 9**).
7. Initiate passive rewarming with blankets and a warm environment.
8. If there is any doubt about whether a pulse is present, begin compressions.

EMR/BLS

9. Assess cardiac rhythm. Attach AED or **cardiac monitor (ALS)**. Shock if needed. If the patient does not respond to one (1) defibrillation, further defibrillation attempts should be deferred.
10. Continue CPR if needed.

ALS



11. Start an IV of Normal Saline (**Procedure 13**).
12. Secure an advanced airway (**Protocol 7**).
13. Administer initial cardiovascular drugs based on presenting rhythm. If the patient fails to respond to the initial drug therapy, defer additional boluses of medication.
14. Continue with CPR/assessment and transport patient to the closest STEMI facility.