HYPOTHERMIA / FROSTBITE

History
- Age, very young and old
- Exposure to decreased temperatures but may occur in normal temperatures
- Past medical history / Medications
- Drug use: Alcohol, barbituates
- Infections/ Sepsis
- Length of exposure/ Wetness/ Wind chill

Signs and Symptoms
- Altered mental status/ coma
- Cold, clammy
- Shivering
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

Differential
- Sepsis
- Environmental exposure
- Hypothyroidism
- Hypoglycemia
- CNS dysfunction
  - Stroke
  - Head injury
  - Spinal cord injury

Temperature Measurement Procedure ***if available***

Temperature Measurement should NOT delay treatment of hypothermia

Remove wet clothing
Dry/ Warm Patient

Passive warming measures

Blood Glucose Analysis Procedure

Age Appropriate
Diabetic Protocol AM 2/ PM 2
as indicated

Hypothermia / Frost Bite

Systemic Hypothermia

Localized Cold Injury

Awake with / without AMS

Unresponsive

Pulse
- YES → Age Appropriate Airway Protocol(s) AR 1 - 7 ***as indicated***
- NO → Exit to Age Appropriate Cardiac Protocol(s) ***See Pearls***

Localized Cold Injury
- General Wound Care
- DO NOT Rub Skin to warm
  DO NOT Massage
  Skin to warm
- DO NOT allow refreezing

Awake with / without AMS
- Age Appropriate Airway Protocol(s) AR 1 - 7 ***as indicated***
- Altered Mental Status Protocol UP 4 ***as indicated***
- Active warming measures
- **B** 12 Lead ECG Procedure
- IV or IO Access Protocol UP 6
- **A** **NORMAL SALINE BOLUS**
  Adult: 500 mL IV / IO
  Repeat to titrate SBP > 90 mmHg
  Maximum 2 L
  Pediatric: 20 mL / kg IV / IO
  Repeat to titrate Age Appropriate
  SBP ≥ 70 + 2 x Age
  Maximum 60 mL / kg
- **P** Cardiac Monitor
- Age Appropriate Hypotension/ Shock Protocol AM 5/ PM 3
  Multiple Trauma Protocol TB 6
  as indicated
- Monitor and Reassess

Notify Destination or Contact Medical Control

Toxic-Environmental Protocol Section

HYPOTHERMIA / FROSTBITE

PASSIVE WARMING: Remove cold/wet clothing by cutting to limit patient movement. Prevent further heat loss by use of blankets. Place the patient in a warm environment.

ACTIVE WARMING: Place hot packs over pulse points with a barrier such as a pillowcase or washcloth. DO NOT place hot packs directly against skin.

Pearls

- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro**
- **NO PATIENT IS DEAD UNTIL WARM AND DEAD (Body temperature ≥ 93.2° F, 32° C.)**
- **Temperature measurement:**
  - **Obtain and document patient temperature if able.**
  - **Many thermometers and routes of measurement are available.**
  - **Order of preference for route of measurement: Rectal > oral > temporal > axillary.**
  - **Many thermometers do not register temperature below 93.2° F.**
- **Hypothermia categories:**
  - Mild 90 – 95° F (32 – 35° C)
  - Moderate 82 – 90° F (28 – 32° C)
  - Severe < 82° F (< 28° C)
- **Mechanisms of hypothermia:**
  - Radiation: Heat loss to surrounding objects via infrared energy (60% of most heat loss.)
  - Convection: Direct transfer of heat to the surrounding air.
  - Conduction: Direct transfer of heat to direct contact with cooler objects (important in submersion.)
  - Evaporation: Vaporization of water from sweat or other body water losses.
- Contributing factors of hypothermia: Extremes of age, malnutrition, alcohol or other drug use.
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- **CPR:**
  - **Severe hypothermia may cause cardiac instability and rough handling of the patient theoretically can cause ventricular fibrillation. This has not been demonstrated or confirmed by current evidence. Intubation and CPR techniques should not be with-held due to this concern.**
  - **Intubation can cause ventricular fibrillation, so it should be done gently by the most experienced provider(s).**
  - **Below 86°F (30° C) antiarrhythmics may not work and if given, should be given at increased time intervals. Contact medical control for direction. Epinephrine can be administered.**
  - **Below 86° F (30°C) pacing should not utilized.**
  - **Consider withholding CPR if patient has organized rhythm or has other signs of life. Contact Medical Control.**
  - **If the patient is below 86° F (30° C) then defibrillate 1 time if defibrillation is required. Deferring further attempts until more warming occurs is controversial. Contact medical control for direction.**
  - **Hypothermia may produce severe bradycardia so take at least 60 seconds to palpate a pulse.**
- **Active Warming:**
  - Remove from cold environment and into warm environment protected from wind and wet conditions.
  - Remove wet clothing and provide warm blankets/ warming blankets.
  - Hot packs can be activated and placed in the armpit and groin area if available. Care should be taken not to place the packs directly against the patient's skin.