**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
- Hypoglycemia
- CNS dysfunction
- Stroke
- Head injury
- Spinal cord injury

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#### Signs / Symptoms of Hypothermia and / or Frostbite

- Remove wet clothing
- Dry / Warm Patient
- Passive warming measures
- Blood Glucose Analysis Procedure

#### Temperature Measurement Procedure

- If available

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#### Localized Cold Injury

- Monitor and Reassess
- General Wound Care
- DO NOT Rub Skin to warm
- DO NOT allow refreezing

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#### Systemic Hypothermia

**Awake with / without AMS**

- Respiratory Distress
- YES

- Age Appropriate Airway Protocol(s) *as indicated*
- Age Appropriate Altered Mental Status Protocol *as indicated*
- Active warming measures
- B 12 Lead ECG Procedure
- IV Procedure P IO Procedure
- Cardiac Monitor
- Normal Saline Bolus
  - 500 mL IV / IO
  - Repeat to effect SBP > 90
  - Maximum 2 L
- PED: Bolus 20 mL/kg IV / IO
  - Repeat to effect Age appropriate SBP ≥ 70 + 2 x Age
  - Maximum 60 mL/kg
- Age Appropriate Hypotension/ Shock or Multiple Trauma Protocol *as indicated*
- Monitor and Reassess

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#### Unresponsive

- Pulse
- YES

- Age Appropriate Respiratory Distress Protocol(s)

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#### Protocol 72

This protocol has been altered from the original 2012 NCCEP Protocol by the Johnston County EMS System Medical Director
Hypothermia / Frostbite

Pearls

- **Recommended Exam**: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro
- NO PATIENT IS DEAD UNTIL WARM AND DEAD (Body temperature ≥ 93.2 degrees F, 32 degrees C.)
- **Hypothermia categories**:
  - Mild 90 – 95 degrees F (32 – 35 degrees C)
  - Moderate 82 – 90 degrees F (28 – 32 degrees C)
  - Severe < 82 degrees F (< 28 degrees 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 withheld due to this concern.
  - Intubation can cause ventricular fibrillation so it should be done gently by most experienced person.
  - Below 86 degrees F (30 degrees C) antiarrythmics may not work and if given should be given at reduced intervals. Contact medical control for direction. Epinephrine / Vasopressin can be administered. Below 86 degrees F (30 degrees) pacing should not be done
  - Consider withholding CPR if patient has organized rhythm or has other signs of life. Contact Medical Control.
  - If the patient is below 86 degrees F (30 degree 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 45 second to palpate a pulse.
- 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.