

# Hypothermia / Frostbite

## History

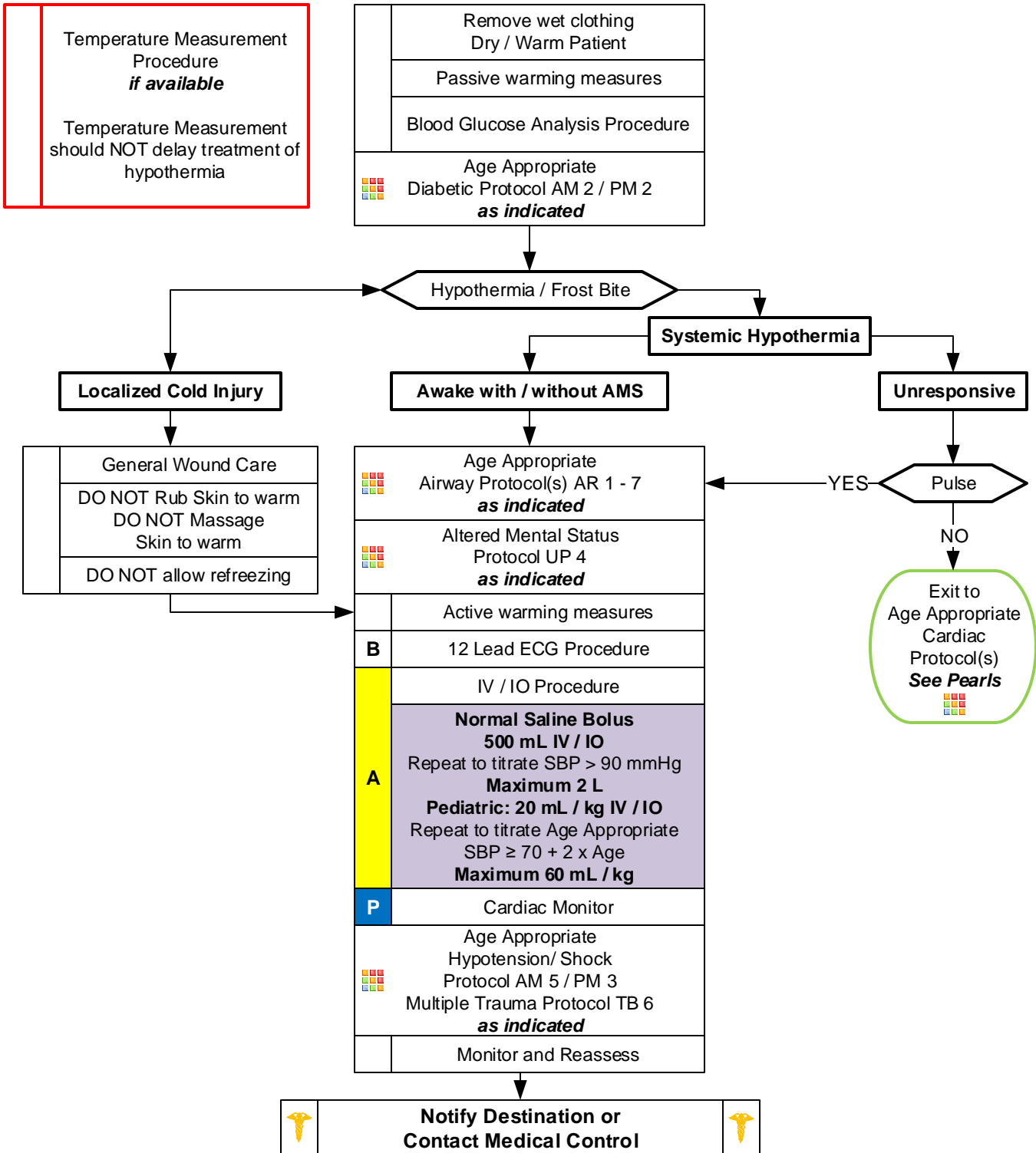
- Age, very young and old
- Exposure to decreased temperatures but may occur in normal temperatures
- Past medical history / Medications
- Drug use: Alcohol, barbituates
- Infections / Sepsis
- Length of exposure / Wetness / Wind chill

## 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





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## Pearls

- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro**
- **NO PATIENT IS DEAD UNTIL WARM AND DEAD (Body temperature  $\geq 93.2^{\circ}$  F,  $32^{\circ}$  C.)**
- **Many thermometers do not register temperature below  $93.2^{\circ}$  F.**
- **Hypothermia categories:**
  - Mild  $90 - 95^{\circ}$  F (  $32 - 35^{\circ}$  C)
  - Moderate  $82 - 90^{\circ}$  F (  $28 - 32^{\circ}$  C)
  - Severe  $< 82^{\circ}$  F (  $< 28^{\circ}$  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 most experienced person.**
  - Below  $86^{\circ}$  F ( $30^{\circ}$  C) antiarrhythmics may not work and if given should be given at increased intervals. Contact medical control for direction. Epinephrine / Vasopressin can be administered. Below  $86^{\circ}$  F ( $30^{\circ}$  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  $86^{\circ}$  F ( $30^{\circ}$  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 to 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.