Hyperthermia
Adult

**History**
- Age, very young and old
- Exposure to increased temperatures and/or humidity
- Past medical history/Medications
- Time and duration of exposure
- Poor PO intake, extreme exertion
- Fatigue and/or muscle cramping

**Signs and Symptoms**
- Altered mental status/coma
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

**Differential**
- Fever (Infection)
- Dehydration
- Medications
- Hyperthyroidism (Thyroid Storm)
- Delirium tremens (DT's)
- Heat cramps, exhaustion, stroke
- CNS lesions or tumors

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**Temperature Measurement** should NOT delay treatment of hyperthermia.

**HEAT CRAMPS**
- Normal to elevated body temperature
- Warm, moist skin
- Weakness, Muscle cramping

**HEAT EXHAUSTION**
- Elevated body temperature
- Cool, moist skin
- Weakness, Anxious, Tachypnea

**HEAT STROKE**
- Fever, usually >104°F (40°C)
- Hot, dry skin
- Hypotension, AMS/Coma

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**Assess Symptom Severity**

**PO**
- Fluids as tolerated
- Monitor and Reassess

**S**
- Temperature Measurement
- Remove from heat source to cool environment
- Cooling measures
- Remove tight clothing
- Blood Glucose Analysis Procedure
- Temperature Measurement

**Diabetic Protocol** as indicated

**Airway Protocol(s)** as indicated

**Altered Mental Status Protocol** as indicated

**Active cooling measures**
- Target Temp < 102.5°F (39°C)

**B**
- 12 Lead ECG Procedure

**A**
- IV/IO Procedure
- Cardiac Monitor
- Normal Saline or Lactated Ringers
  - Bolus 500 mL IV/IO
  - Repeat to effect SBP > 90
  - Maximum 2 L
- Hypotension / Shock Protocol as indicated

**P**
- Monitor and Reassess

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**Contact Destination or Medical Control**
Hyperthermia
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Pearls
- **Recommended Exam:** Mental Status, Skin, HEENT, Heart, Lungs, Neuro
- Extremes of age are more prone to heat emergencies (i.e. young and old). Obtain and document patient temperature if able.
  - Predisposed by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
  - Cocaine, Amphetamines, and Salicylates may elevate body temperatures.
  - Intense shivering may occur as patient is cooled.
  - **Heat Cramps:**
    Consists of benign muscle cramping secondary to dehydration and is not associated with an elevated temperature.
  - **Heat Exhaustion:**
    Consists of dehydration, salt depletion, dizziness, fever, mental status changes, headache, cramping, nausea and vomiting. Vital signs usually consist of tachycardia, hypotension, and an elevated temperature.
  - **Heat Stroke:**
    Consists of dehydration, tachycardia, hypotension, temperature ≥ 104°F (40°C), and an altered mental status. Sweating generally disappears as body temperature rises above 104°F (40°C).
    The young and elderly are more prone to be dry with no sweating.
    **Exertional Heat Stroke:**
    In exertional heat stroke (athletes, hard labor), the patient may have sweated profusely and be wet on exam. Rapid cooling takes precedence over transport as early cooling decreases morbidity and mortality.
    If available, immerse in an ice water bath for 5 – 10 minutes. Monitor rectal temperature and remove patient when temperature reaches 102.5°F (39°C). Your goal is to decrease rectal temperature below 104°F (40°C) with target of 102.5°F (39°C) within 30 minutes. Stirring the water aids in cooling.
    Other methods include cold wet towels below and above the body or spraying cold water over body continuously.
  - **Neuroleptic Malignant Syndrome (NMS):**
    Neuroleptic Malignant Syndrome is a hyperthermic emergency which is not related to heat exposure. It occurs after taking neuroleptic antipsychotic medications.
    This is a rare but often lethal syndrome characterized by muscular rigidity, AMS, tachycardia and hyperthermia.
    **Drugs Associated with Neuroleptic Malignant Syndrome:**
    Prochlorperazine (Compazine), promethazine (Phenergan), clozapine (Clozaril), and risperidone (Risperdal)
    metoclopramide (Reglan), amoxapine (Ascendin), and lithium.
    **Management of NMS:**
    Supportive care with attention to hypotension and volume depletion.
    Use benzodiazepines such as diazepam or midazolam for seizures and / or muscular rigidity.