Environmental emergencies

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Loss of heat

- Four ways of losing heat:
- Conduction
  - Transfer of heat due to **direct contact** from warmer to cooler bodies/objects
- Convection
  - Currents of air or water pass over body carrying heat away
- Radiation
  - Heat that the body emits in waves usually lost from the head and neck
- Respiration
  - Loss of heat by expiring warm air

Hypothermia ("Cold Injuries")

- Cold emergencies
- Generalized body cooling

Mild hypothermia

- Core temperature above 95 degrees
- Signs and Symptoms
  - **Shivering**
  - Stamping feet
  - Increased pulse and respiratory rate
  - Red skin → pale skin as temperature drops

Moderate hypothermia

- Core temperature above 90 degrees
- Signs and Symptoms
  - Rigidity
  - Decreases LOC
  - Skin becomes pale
  - Additional increase in pulse and respiratory rate
  - Lethargy

Severe hypothermia

- Unresponsive → Cardiac arrest

Cardiac arrest implications

- Not dead until **WARM and DEAD**
- Cardiac arrest patients in hypothermia can often preserve brain function for a much longer time
- → ***Give them the benefit of doubt!***

Frostbite – local cold injury

- Localized cooling with prolonged freezing resulting in gangrene or death of tissue
- Skin usually "blanched"
- ***Do not rewarm if there is a chance that it may become frozen again***

Localized Hypothermia -- treatment

- **Remove patient from cold environment**
- Protect affected areas
- Initial assessment
- Oxygen
- Remove clothing from affected areas

Localized Hypothermia – treatment - 2

- Superficial local cold injury?
  - Remove jewelry
  - Splint and cover extremity
  - Do not rub, massage or expose to cold
- Deep local cold injury?
  - Remove jewelry
  - Cover exposed areas with dry dressings
  - Do not break blisters, rub, massage, apply heat or allow patient to walk on affected areas

Localized Hypothermia – treatment - 3

- Transport – keep patient warm
- For transport time>30 minutes – "active rewarming"
  - Immerse affected part in warm water – **not to exceed 105 degrees**
  - Dry sterile dressings – dress between affected fingers and toes
  - Protect against refreezing

Generalized hypothermia – treatment -- general

- Handle very gently, prevent cardiac arrest from "VFIB"
- Remove from cold
  - Remove wet clothing
  - Wrap in dry blankets
- Do not allow exertion
- ABCs
  - Oxygen
  - Allow 30-45 seconds for pulse check
  - CPR as needed

Generalized hypothermia – treatment

- Patient alert?
  - Actively rewarm patient
    - Heat packs to groin area, lateral chest and neck
- Patient unconscious or not responding appropriately?
  - Passively rewarm patient
  - Start CPR as needed
  - Do not allow eating or drinking
  - Transport immediately

Hyperthermia

- Heat exhaustion ("Patients presenting with moist, pale, and normal to cool temperature")
- Heat stroke ("Patients presenting with hot, dry or moist skin")
  - ***Progression often occurs from heat exhaustion to heat stroke unless the situation is corrected***
- ***Children and the elderly most at risk***
- Certain common medications can make hyperthermia more severe

Patients presenting with moist, pale, and normal to cool temperature

- Caused by prolonged heat exposure or extreme physical activity causing loss of body salts ("electrolytes")
- Signs and symptoms include
  - Cramps
  - Weakness
  - **Pale moist skin**
  - Nausea/vomiting
  - Weak pulse
  - **Dropping BP as patient becomes more dehydrated**

Patients presenting with moist, pale, and normal to cool temperature -- treatment

- ABCs -- Oxygen
- **Remove from heat to a cool environment – remove outer clothing**
- Place patient in shock position
- Transport immediately
  - During transport remove excess clothing and fan the patient
- Patient conscious, not nauseated, able to drink without assistance?
  - Have patient drink water
- Patient unconscious or vomiting?
  - Transport with patient in recovery position

Patients presenting with hot, dry or moist skin

- Body loses the ability to regulate its temperature – causing excess body heat that can not be removed
- S/S include:
  - **Hot most often dry skin**
  - AMS → Loss of consciousness
  - **Little or no perspiration**
  - Seizures
  - death

Patients presenting with hot, dry or moist skin -- treatment

- ABCs -- Oxygen
- Remove from heat to A/C environment
- Remove outer clothing
- Active cooling
  - Ice packs to groin, neck, armpits
  - Cool wet towels on body
  - Fan the patient aggressively
- Transport immediately

Heat emergencies – some common sense

- **Call for ALS!** – although NY State protocol does not mention it
- Do not dump the patient in a cold bath
- Why not?

S/S of dehydration/ Hypovolemia

- Poor skin "turgor" – tenting
- Extreme thirst
- Positive orthostatic changes – (positive tilt test)

Positive orthostatic changes

- When moving patient from supine position to sitting/standing position:
- If Systolic BP drops by at least 20 -- or Pulse rate increases by at least 10
- ***Must wait 1 – 2 minutes once position is changed***
- ***<u>STOP</u> if patient becomes distressed in any way***