Chapter 6: Environmental Considerations

What is hyperthermia?

- Elevated body temperature

How does the physiological processes in the body continue to function?

- As long as body temperature is maintained within normal limits

Maintenance of normal temperature in a hot environment depends on what?

- The ability of the body to dissipate heat

Heat can be gained or lost through what five processes?

- Metabolic heat production
- Conductive heat exchange
- Convective heat exchange
- Radiant heat exchange
- Evaporative

What is metabolic heat production?

- Production and radiation of heat under it’s natural power; thermoregulatory

What is conductive heat exchange?

- Physical contact with other objects can result in either a heat loss or heat gain

What is convective heat exchange?

- Body heat can either be lost or gained depending on the temperature of the circulating medium

What is radiant heat exchange?

- Radiant heat from sunshine causes an increase in body temperature

What is evaporative heat loss?

- Sweat glands in the skin allow water to be transported to the surface, where it evaporates, taking large quantities of heat with it

How much water can a normal person sweat off in one to two hours?

- One quart

Does sweating cause heat loss?

- No

What must happen to sweat in order for heat to dissipate?

- Sweat must evaporate

In order for evaporation to occur, what must the air be relatively free of?

- Water

When is heat loss through evaporation severely impaired?

- When relative humidity reaches 65%

When does heat loss through evaporation virtually stop?

- When relative humidity reaches 75%

What is heat rash?

- A benign condition associated with a red, raised rash accompanied by sensations of prickling and tingling during sweating.
- It usually occurs when the skin is continually wet with un-evaporated sweat.

What is heat syncope?

- Associated with rapid physical fatigue during overexposure to heat (pass out)

How is heat syncope relieved?

- By laying the athlete down in a cool environment
- Replacing fluids

What are heat cramps?

- Extremely painful muscle spasms
- Occurs mainly in the calf and abdomen

What are heat cramps related to?

- Excessive loss of water and several electrolytes or ions, which are essential elements in muscle contraction

What is the immediate treatment for heat cramps?

- Ingestion of large quantities of water
- Mild stretching with ice massage

What is heat exhaustion?

- Inadequate replacement of fluids lost through sweating

What are the signs and symptoms of heat exhaustion?

- Collapse
- Profuse sweating
- Pale skin
- Mildly elevated temperature (102ºF)
- Hyperventilation
- Rapid pulse

What is the immediate treatment for heat exhaustion?

- Ingestion and eventually intravenous replacement of large quantities of water
- Place in cool environment

What is heat stroke?

- Serious, life-threatening emergency.
- The specific cause is unknown
- Breakdown of the thermoregulatory system

What are the signs and symptoms for heat stroke?

- Sudden collapse with loss of consciousness
- Flushed, hot skin
- Little sweating
- Shallow breathing
- Rapid strong pulse
- Core temperature greater than (106º)
- Breakdown of the thermoregulatory mechanism.

What is the immediate treatment for heat stroke?

- Cool environment
- Sponge with cool water
- Fan with a towel
- Get to the hospital

What does prevention of hyperthermia involve?

- Gradual acclimatization
- Identification of susceptible individuals
- Lightweight uniforms
- Routine record keeping
- Unrestricted fluid replacement
- Well-balanced diet
- Routine temperature and humidity readings

What is hypothermia?

- Lowered body temperatures

What will easily predispose an athlete to hypothermia?

Combination of

- Cold
- Wind
- Dampness

What are the cold injuries included in sport?

- Frostnip
- Frostbite

What is frost nip?

- Exposure to damp, freezing cold involving ears, nose, cheeks, chin, fingers, and toes
- Commonly occurs when there is wind, severe cold, or both.

What is the treatment of frost nip?

- Firm, sustained pressure of the hands without rubbing
- Blowing hot breath on the spot
- Placing the area in the armpits

What is frost bite?

- Exposure to dry temperatures well below freezing

Three forms of frost bite:

- Chilbains
  - results from prolonged and constant exposure to cold for many hours.
- Superficial frostbite
  - involves only the skin and subcutaneous tissue.
- Deep frostbite
  - is a serious injury indicating tissues that are frozen

What is the treatment for frostbite?

- Rapid re-warming is required!
- Hot drinks
- Heating pads
- Hot water bottles that are 100º to 110º F
- During re-warming, the tissue will become blotchy red, swollen, and extremely painful
- Later, the injury may become gangrenous, causing a loss of tissue