INTEGUMENTARY SYSTEM

OBJECTIVE #6: Explain how the skin regulates body temperature.

D. Regulation of body temperature [Figure 6.8 pg. 121]

1. _____ *FUNCTION*!!!! Heat loss must be balanced by heat production.
2. Normal body temperature: _____
   └(_____ *may be 35.6^{0}C -37.8^{0}C = 96-100^{0}F*)
3. Heat is a product of cellular metabolism and heat affects the _____ _____.
4. Major heat producers: _____ & _____ muscle cells and certain _____
5. Physiologic adjustments controlled by "_____" in _____through autonomic nervous pathways.
6. Excessive heat loss in body: (→ _____)
   a. Skin _____ receptors stimulated and blood flow _____ by nerve impulses
   b. _____ and _____ metabolic activity occur
   c. Body hair muscles _____
   d. Nervous system may stimulate muscle fibers in the skeletal muscles to contract slightly involuntary and rhythmically with greater force -- _____ -- generating more heat
   e. Behavioral responses occur: curling up _____, huddling or cuddling, rubbing hands together, warm clothing
   f. Conditions
      1) _____

         a) Definition: _____temp below _____
         b) Symptoms: vital signs____ , shivering, coldness, mental confusion, _____, loss of consciousness (_____^{o}F) /reflexes, body shuts down _____
      2) _____: skin cells chilled by internal ice crystals and deprived of O_2 and nutrients → _____
7. Excessive heat production in body: (→ _____)
   a. Skin _____ receptors and the blood are stimulated by nerve impulses
   b. _____ and _____ metabolic rate result
   c. Active muscles _____ carried away by _____ (flushing)
   d. Eccrine glands stimulated _____ to skin surface for _____

e. Behavioral responses occur: lethargy, resting with limbs _____ _____, wearing lighter clothing, drinking cool drinks, swimming...

f. Conditions

1) _____

a) Definition: _____temp exceeds _____

b) Symptoms: vital signs _____, sweating

c) Physiology: _____ of hypothalamus begins a _____ in which body temp. _____, metabolic rate ____, heat production _____, temp. continues ____

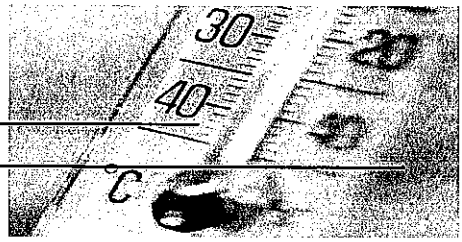
2) _____: cool water immersion and fluid intake required

3) heat _____: collapse during vigorous activity from excessive fluid loss (_____), low _____, rapid _____ , cool and clammy

****NOTE: High humidity hinders evaporation process. Athletes beware!****

8. FEVER

a. Definition: an increase in core body temperature of one to several degrees



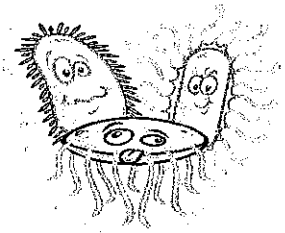
b. Cause(s)

1) _____

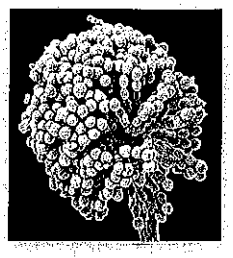
2) _____ 3) _____

4) _____

c. Injured tissue and WBC release _____



d. Blood carries pyrogens to hypothalamus _____ the set point controlling temperature which promotes _____ _____ (vasoconstriction/shivering- AKA: chills) New set point is maintained until body defenses/antibiotics reverse set point resulting in _____



e. Increase in body temperature can help immune system kill pathogen → high temp. causes _____ to sequester ____, reducing the level in the blood. Bacteria/Fungi require more iron as temp ↑, _____. Hence a low-grade fever over short-term may be desired.

f. Increased temperature for extended periods can denature proteins and cause permanent brain damage.