Heat and Cold Emergencies

♦ KNOWLEDGE OBJECTIVES

1. Identify three conditions that can result from overexposure to heat.

2. List three signs and symptoms that would lead you to suspect a heat-related illness.

3. Describe when to summon more advanced medical personnel for a person with heat-related illness.

4. Describe how to care for a person you suspect is suffering from heat-related illness.

5. List at least two signs and symptoms of frostbite.

6. Describe how to care for frostbite.

7. List five signs and symptoms that would lead you to suspect hypothermia.

8. Describe how to care for a person you suspect is suffering from hypothermia.

9. Describe five precautions to prevent heat and cold emergencies.

10. Define the key terms for this chapter.

♦ SKILL OBJECTIVES

After reading this chapter and completing the class activities, you should be able to

1. Make appropriate decisions about care when given an example of an emergency in which someone has become ill because of overexposure to heat or cold.
♦ OUTLINE

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♦ KEY POINTS

Factors Affecting Body Temperature
♦ Air temperature.
♦ Humidity.
♦ Wind.
♦ Clothing.
♦ Activity.
♦ Fluid intake.
♦ Body adaptability.

Factors Affecting Risk of Heat- and Cold-Related Illness
♦ Age.
♦ Strenuous activity.
♦ Predisposing health problems.

Signs and Symptoms of Heat-Related Emergencies
♦ Heavy sweating.
♦ Rapid onset.
♦ Pain.
♦ Muscle spasms.
♦ Dizziness/weakness.
♦ Cool/moist skin.
♦ Nausea.
♦ Sweating stops.
♦ Rapid rise in body temperature.
♦ Altered consciousness.
♦ Convulsions.
♦ Body systems fail.

Care for Heat-Related Emergencies
♦ Cool the casualty by removing from hot environment.
♦ Giving cool water if conscious.
♦ Loosening/removing clothing.
♦ Applying wet towels/cold packs.
♦ Fanning.

Cold-Related Emergencies
♦ Frostbite.
♦ Hypothermia.

Signs and Symptoms of Frostbite
♦ Cold skin.
♦ Discolouration.
Care for Frostbite

♦ Handle gently.
♦ Do not rub affected area.
♦ Warm in 38°C to 40°C water (100°F - 105°F).
♦ Bandage loosely.

Signs and Symptoms of Hypothermia

♦ Shivering.
♦ Numbness.
♦ Apathy.
♦ Altered consciousness.

Care for Hypothermia

♦ Remove wet clothing.
♦ Gradually rewarm by using dry blankets and clothing.
♦ Moving to a warm location.
♦ Giving warm liquid.
♦ Summoning more advanced medical personnel.
**LEARNING ACTIVITIES**

**Matching**

Match each term with its definition. Write its letter on the line in front of the definition.

**Terms**

a. Frostbite
b. Heat exhaustion
c. Heat stroke
d. Hypothermia
e. Wind chill
f. Heat cramps

**Definitions**

1. _____A figure that represents the combination of the temperature and wind speed
2. _____Painful spasms of skeletal muscles following exercise or work in warm or moderate temperatures
3. _____A condition in which body tissues freeze
4. _____A condition in which the body's warming mechanisms fail, and the entire body cools
5. _____A form of shock resulting from strenuous physical efforts in hot environments
6. _____A life-threatening condition that develops when the body's cooling mechanisms are overwhelmed by heat, and the body systems fail

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**Short Answer**

Read each statement or question and write the correct answer or answers in the space provided.

1. List the four signs and symptoms of frostbite.
   1. ____________________________________
   2. ____________________________________
   3. ____________________________________
   4. ____________________________________

2. List at least three precautions you can take to prevent heat- or cold-related emergencies.
   1. _________________________________
   2. _________________________________
   3. _________________________________

3. What are the signs and symptoms of heat stroke and heat exhaustion?

   **Heat Stroke**
   ____________________________________
   ____________________________________
   ____________________________________

   **Heat Exhaustion**
   ____________________________________
   ____________________________________
   ____________________________________
4. What are the three signs that a heat-related illness is becoming worse and more advanced medical personnel need to be summoned?
   1. ____________________________
   2. ____________________________
   3. ____________________________

5. What are three conditions that can result from overexposure to heat?
   1. ____________________________
   2. ____________________________
   3. ____________________________

**CASE STUDIES**

Read the case studies below and answer the questions.

**Case 18.1**

A 72-year-old woman becomes confused and wanders out of her house in her bare feet. The outside temperature is minus 7 degrees C (20 degrees F), and there is snow on the ground. When you find her, she is conscious and able to talk with you but does not remember what happened. She says that her left foot is numb. It looks yellow and waxy.

1. Which of the following conditions is responsible for the condition of her left foot?
   a. Stroke
   b. Hypothermia
   c. Aneurysm
   d. Frostbite

2. List the signs and symptoms of frostbite you find in the scenario.
   ____________________________
   ____________________________
   ____________________________

3. After you move her into a warm environment, how would you care for this casualty's foot?
   a. Rub the foot gently to restore circulation.
   b. Wrap the foot snugly in a moist, warm dressing.
   c. Separate the toes with cotton or gauze, and bandage the foot after soaking in warm water.
   d. Break any blisters that appear, and cleanse the foot with soap and water.

4. T F This casualty should be seen by more advanced medical personnel as soon as possible.

**Case 18.2**

The day is hot and humid. You and the rest of the emergency response team arrive at a scene where a bicycle racer has stopped and sat down. He is conscious. His skin is red, hot, and wet. His breathing is rapid and shallow. You see no injuries other than minor abrasions.

1. From which of the following is the racer likely to be suffering?
   a. Heat cramps
   b. Heatstroke
   c. Heat exhaustion
   d. Transient ischemic attack
2. What should you do to cool the casualty?
   a. Give him cool water to drink.
   b. Remove his helmet and any restrictive clothing.
   c. Cool his body with wet towels and fanning.
   d. b and c.

3. Besides cooling the casualty's body, what else would you do immediately?
   a. Minimize shock.
   b. Sponge the casualty with alcohol.
   c. Apply a cold pack to the face.
   d. All of the above.

4. Which of the following is a sign that the condition of the casualty is worsening?
   a. Shivering
   b. Vomiting
   c. Pale, moist skin
   d. Slowing heart rate

5. T F If the casualty begins to cool down, regains consciousness, and says he "feels fine," it would be appropriate to let him resume the race.

Case 18.3

You are summoned to the house of an 80-year-old woman by her visiting granddaughter. The woman is lying on the floor of an old home. The temperature in the house feels low, probably below 13 degrees C (55 degrees F).

The woman, clothed in her bathrobe, mumbles something incoherently. She is staring into space and occasionally shivering. Her pulse is slow with occasional skipped beats.

1. Which of the following conditions would you suspect she is experiencing?
   a. Diabetic emergency
   b. Hypothermia
   c. Hypoglycaemia
   d. Shock

2. How would you care for this casualty?
   a. Gradually rewarm her.
   b. Remove her clothing.
   c. Give her warm water to drink.
   d. a and c.

3. T F This is a situation in which you should call for assistance from more advanced medical personnel.

4. Why would it be inappropriate initial care to immerse the casualty in warm water?
**SELF-ASSESSMENT**

Circle the letter of the best answer.

1. A man has been exposed to the cold. The skin on his feet has become yellow, and he has no feeling in the feet. The skin feels cold and hard. The man is a casualty of
   a. Gangrene.
   b. Frostbite.
   c. Trench foot.
   d. Hypothermia.

2. Precautions you can take that will help you prevent both heat- and cold-related illnesses include
   a. Avoiding being outdoors in the hottest or coldest part of the day.
   b. Wearing dark coloured clothing when in the sun.
   c. Drinking small amounts of fluids.
   d. b and c.

3. Three conditions that can result from overexposure to heat are
   b. Heat stress, heat exhaustion, and heat strain.
   d. Heat cramps, heat exhaustion, and heat stroke.

4. When should you remove a frostbitten foot from the warm water in which you have immersed it?
   a. When the feeling returns to the foot
   b. When the foot begins to turn red and feel warm
   c. When the foot begins to become painful and begins to swell
   d. When the toes begin to tingle and a pulse can be felt in the foot

5. While you are providing emergency care to a casualty of a heat-related illness, which of the following signs indicates that you should immediately call more advanced medical personnel?
   a. The casualty loses consciousness.
   b. The casualty refuses water or vomits.
   c. The casualty begins to sweat profusely.
   d. a and b.

6. Which of the following should you do to care for a casualty of hypothermia?
   a. Immerse the casualty in warm water.
   b. Summon more advanced medical personnel.
   c. Rub the casualty's arms and legs briskly.
   d. All of the above.
7. Signs and symptoms of heat exhaustion include
   a. Headache and nausea.
   b. Cool, moist, pale skin.
   c. Dizziness and weakness.
   d. All of the above.

8. You suspect a person is suffering from hypothermia. What do you expect to find when you check the pulse?
   a. Weak, rapid pulse
   b. Full, bounding pulse
   c. Slow, irregular pulse
   d. Normal rate and rhythm

9. If you used ice to cool a heat stroke casualty, where would you place the ice?
   a. Under the casualty's leg
   b. In the casualty's armpits
   c. On the casualty's chest
   d. On the casualty's head

10. If a casualty of a suspected heat-related illness begins to lose consciousness, you should
    a. Cool the body using wet sheets or towels, or cold packs.
    b. Cool the body by applying rubbing alcohol.
    c. Call advanced medical personnel.
    d. a and c.

11. A 72-year-old woman is found confused and shivering after leaving her house without adequate clothing. The outside temperature is -7 °C (20° F), and there is snow on the ground. She is able to talk, but does not remember what happened. Which of the following is responsible for her condition?
    a. Stroke.
    b. Hypothenmia.
    c. Aneurysm.
    d. Frostbite.

12. Which are the major mechanisms used by the body to remove heat from the body core?
    a. Constriction of blood vessels near the skin and shivering.
    b. Dilation of the blood vessels near the skin and evaporation of sweat.
    c. Reduction of body metabolism rate and increased breathing rate.
    d. Increased metabolism of fat and reduced metabolism of carbohydrates.
13. The signs and symptoms of heat exhaustion are often nearly identical to those of
a. Narcotic overdose.
b. Diabetic coma.
c. Stroke.
d. Shock.

14. Which of the following steps is NOT part of the emergency care for a casualty of heat-related illness?
   a. Have the casualty take salt tablets.
   b. Cool the casualty.
   c. Lightly stretch and massage a muscle cramp.
   d. Provide small amounts of water or a commercial sports drink to a conscious casualty.

15. How would you care for a frostbitten foot?
   a. Rub the foot aggressively to restore circulation.
   b. Wrap the foot snugly in a moist, warm dressing.
   c. Separate the toes with cotton or gauze when bandaging.
   d. Break any blisters that appear, and cleanse the foot with soap and water.

16. How do the blood vessels near the surface of the skin allow excess heat to move out of the body?
   a. By contracting.
   b. By dilating.
   c. By closing the skin pores.
   d. By opening the skin pores.

17. Which of the following is NOT a sign of heat exhaustion?
   a. Headache and nausea.
   b. Cool, moist, pale skin.
   c. Dizziness and weakness.
   d. Hot, red, dry skin.

18. When should you remove a frostbitten foot from the warm water in which you have immersed it?
   a. When feeling returns to the foot.
   b. When the foot begins to turn red and feel warm.
   c. When the foot begins to become painful and begins to swell.
   d. When the toes begin to tingle and a pulse can be felt in the foot.
Answers to Exercises
Unit 18-Heat and Cold Emergencies

Matching:
1. e
2. f
3. a
4. d
5. b
6. c.

Short Answer:
1. - Lack of feeling in the affected area; skin that appears waxy; skin that is cold to the touch; skin that is discoloured (flushed, white, yellow, blue).
2. - Avoid being outdoors in the hottest or coldest part of the day
   - Change your activity level according to the temperature
   - Take frequent breaks
   - Dress appropriately for the environment
   - Drink large amounts of fluids.
3. **Heat Stroke**: High body temperature; red, hot, dry skin; progressive loss of consciousness; rapid, weak pulse; rapid, shallow breathing;
   **Heat Exhaustion**: Normal or below normal body temperature; cool, moist, pale skin; headache; nausea; dizziness and weakness; exhaustion.
4. Refusing water; Vomiting; changes in level of consciousness.
5. Heat cramps; heat exhaustion; heat stroke.

Case Study 18.1:
1. d
2. Foot numb; waxy appearance of skin; yellow discolouration of skin.
3. c
4. T.

Case Study 18.2:
1. c
2. d
3. a
4. b
5. F.

Case Study 18.3:
1. b
2. a
3. T
4. Rapid rewarming can cause dangerous heart rhythms.

Self-Assessment:
1. b
2. a
3. d
4. b
5. d
6. b
7. d
8. c
9. b
10. d.
11. b.
12. b.
13. d.
14. a.
15. c
16. b
17. d
18. d