National EMS Education Standard Competencies

Trauma
Applies fundamental knowledge to provide basic emergency care and transportation based on assessment findings for an acutely injured patient.

Environmental Emergencies
Recognition and management of
- Submersion incidents (pp 1157–1160, 1164–1165)
- Temperature-related illness (pp 1143–1146, 1149–1152, 1154–1157)
Pathophysiology, assessment, and management of
- Near drowning (pp 1157–1160, 1162–1164)
- Temperature-related illness (pp 1143–1157)
- Bites and envenomations (pp 1166–1172)
- Dysbarism (p 1165)
  - High altitude (p 1165)
  - Diving injuries (pp 1160–1164)
- Electrical injury (pp 1165–1166)
- Radiation exposure (Chapter 40, Terrorism Response and Disaster Management)

Knowledge Objectives
1. Identify the four factors that affect how a person deals with exposure to a cold or hot environment. (pp 1141–1142)
2. Describe the five ways heat loss occurs in the body, and how the rate and amount of heat loss or gain can be modified in an emergency situation. (pp 1142–1143)
3. Describe the four general stages of hypothermia. (pp 1143–1144)
4. Describe local cold injuries and their underlying causes. (pp 1145–1146)
5. Describe the process of providing emergency care to a patient who has sustained a cold injury, including assessment of the patient, review of signs and symptoms, and management of care. (pp 1146–1150)
6. Explain the importance of following local protocols when rewarming a patient who is experiencing moderate or severe hypothermia. (p 1149)
7. Describe the three emergencies that are caused by heat exposure, including their risk factors, signs, and symptoms. (pp 1151–1152)
8. Describe the process of providing emergency care to a patient who is experiencing a heat emergency, including assessment of the patient, review of signs and symptoms, and management of care. (pp 1152–1157)
9. Describe drowning, including its incidence, risk factors, and prevention. (pp 1157–1158, 1165)
10. List the basic rules of performing a water and ice rescue. (p 1158)
11. Explain why EMTs should have a prearranged rescue plan based on the environment in which they work. (p 1158)
12. List five conditions that may result in a spinal injury following a submersion incident and the steps for stabilizing a patient with a suspected spinal injury in the water. (pp 1157–1160)
13. Discuss recovery techniques and resuscitation efforts EMTs may need to follow when managing a patient who has been involved in a submersion incident. (p 1160)
14. Describe the three types of diving emergencies, how they may occur, and their signs and symptoms. (pp 1160–1162)
15. Describe the process of providing emergency care to a patient who has been involved in a drowning or diving emergency, including assessment of the patient, review of signs and symptoms, and management of care. (pp 1162–1164)
16. Discuss the types of dysbarism injuries, including their incidence, risk factors, signs and symptoms, and emergency medical treatment. (p 1165)
17. Discuss lightning injuries, including their incidence, risk factors, signs and symptoms, and emergency medical treatment. (pp 1165–1166)
18. Describe the process of providing emergency care to patients who have been bitten by each of the following venomous spiders: (pp 1166–1167)
   - Black widow spider
   - Brown recluse spider
19. Describe the process of providing emergency care to a patient who has sustained a bite or sting from each of the following insects and arachnids, including steps the EMT should follow if a patient develops a severe reaction to the sting or bite: (pp 1167–1168, 1171–1172)
   - Hymenoptera (bees, wasps, yellow jackets, and ants)
   - Scorpions
   - Ticks
20. Describe the process of providing emergency care to a patient who has been bitten by each of the following types of snake and is showing signs of envenomation: (pp 1168–1171)
   - Pit viper
   - Coral snake
21. Describe the process of providing emergency care to a patient who has been stung by a coelenterate or other marine animal. (p 1173)
Skills Objectives

1. Demonstrate the emergency medical treatment of local cold injuries in the field. (p 1150)
2. Demonstrate how to use a warm-water bath to rewarm the limb of a patient who has sustained a local cold injury. (p 1150)
3. Demonstrate how to treat a patient with heat cramps. (p 1154)
4. Demonstrate how to treat a patient with heat exhaustion. (pp 1154–1156, Skill Drill 32-1)
5. Demonstrate how to treat a patient with heat stroke. (pp 1156–1157)
6. Demonstrate how to stabilize a patient with a suspected spinal injury in the water. (pp 1157–1160, Skill Drill 32-2)
7. Demonstrate how to care for a patient who is suspected of having an air embolism or decompression sickness following a drowning or diving emergency. (p 1164)
8. Demonstrate how to care for a patient who has been bitten by a pit viper and is showing signs of envenomation. (pp 1170–1171)
9. Demonstrate how to care for a patient who has been bitten by a coral snake and is showing signs of envenomation. (p 1171)
10. Demonstrate how to care for a patient who has sustained a coelenterate envenomation. (p 1173)

Introduction

The human body functions best when all body systems operate in balance, a concept known as homeostasis. Environmental factors such as temperature and atmospheric pressure can overwhelm the body’s ability to cope with its surroundings. A variety of medical emergencies can result, particularly in children, older people, people with chronic illnesses, and young adults who overexert themselves. These can lead to mental status changes, functional changes and, possibly, death. Environmental emergencies can occur in any setting and often accompany other illnesses and injuries that require treatment at the same time. For example, a trauma patient with hypothermia has a higher risk of death than a patient with a normal body temperature. As an EMT, you can save lives by recognizing and responding properly to these emergencies, most of which require prompt treatment in the hospital.

In this chapter you will learn how the body regulates core temperature, and the ways in which heat loss can occur. The various forms of heat-, cold-, and water-related emergencies are described, including how to diagnose and treat hypothermia, frostbite, and hyperthermia. You will also learn about pressure-related emergencies, or dysbarism injuries, caused by diving and high-altitude climbing; injuries caused by lightning; and envenomation, caused by bites and stings.

Factors Affecting Exposure

The following four factors will affect how a person deals with a cold or hot environment. These can be used as prevention strategies for those who work or play in extreme environmental temperatures. Consider these factors during the assessment of your patient to determine whether he or she was prepared for a cold or hot environment. A hiker prepared for a warm summer hike in the foothills will present and respond to treatment differently than a traveler stranded in a hot vehicle because the radiator boiled over.

1. Physical condition. Patients who are ill or in poor physical condition will not be able to tolerate extreme temperatures as well as those whose cardiovascular, metabolic, and nervous systems are all functioning well. For example, an athlete in peak physical condition performs better and is less likely to experience injury or illness than someone with a less active lifestyle. Exertion also plays a role. For instance, a brisk walk will

YOU are the Provider

At 1415 hours, you are dispatched to a residence at 1102 Rosewood Avenue for a 55-year-old man who fainted after working in his garden. The temperature is 98°F (36.7°C) and the humidity is high. You and your partner proceed to the scene; your response time is 7 minutes.

1. How does the body normally balance heat production and elimination?
2. What factors can decrease the body’s ability to eliminate excess heat?