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**Continuing Education  
Material:**

**SUMMERTIME  
HAZARDS**

**ABP LLC**

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# ABP CONTINUING EDUCATION MATERIAL

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## SUMMERTIME HAZARDS

### OBJECTIVES

1. Discuss the heat-related illness and prevention.
2. Discuss water-related tragedy and prevention.
3. Discuss lightening injury and prevention.
4. Discuss bee and wasp injuries and prevention.
5. Discuss snakebites and prevention.

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This continuing education material, *Summertime Hazards*, will earn the participant 1.5 contact hours. If you have any questions regarding this information or would like further information on other continuing education opportunities, please contact:

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## SUMMERTIME HAZARDS

### Heat-Related Illness

If you cannot effectively cool down after exposure to high environmental temperatures, you are at risk. Of the heat-related illnesses like heat cramps, heat syncope (fainting), heat exhaustion, and heatstroke, only heatstroke is a true medical emergency. Heat-related illnesses are more common when the temperature is above 95°F and the humidity is greater than 80%. Other risk factors, especially for infants and older adults, include dehydration, fatigue, sleep deprivation, obesity, cardiovascular disease, fever, muscular exertion, mental impairment, seizures, sunburn, and use of certain medication such as beta blockers, diuretics, amphetamines and angiotensin-converting enzyme inhibitors. When a heatstroke victim's temperature regulatory mechanisms fail, the body temperature may exceed 104°F. Without prompt treatment, organ system failure results and the victim has a high risk of death. Heatstroke is best differentiated from other heat-related illnesses by mental status changes that occur as a consequence of a critically elevated body temperature. Thermal injury to the brain produces anxiety, confusion, bizarre behavior, loss of coordination, hallucinations, agitation, seizures and coma.

The first treatment priority is to rapidly cool the patient. Remove as much clothing as practical and place ice packs on the victim's neck, under the armpit, chest, abdomen, and groin. Use a garden hose or even a spray bottle of water to moisten the victim's skin, and then use a fanning action to take full advantage of evaporative heat loss. Another good option is to immerse the victim in cool water to quickly reduce body temperature. Avoid immersion in ice-cold water because shivering generates body heat and increases oxygen consumption. By causing subcutaneous vasoconstriction, ice water immersion may also slow heat transfer via conduction. Impaired consciousness threatens airway integrity so do not give the victim anything by mouth if not fully awake and alert. Call for an ambulance right away. EMS will administer high concentration oxygen and a saline IV to help with the dehydration. Once at the hospital the victim will be treated with aggressive cooling methods such as temperature-regulating blankets and iced gastric and peritoneal lavage in order to get the body temperature lowered to at least 100.4°F. The patient will be monitored continuously to make sure that the cooling does not cause hypothermia. Medication can be administered to control the shivering.

### Heat-Related Illness Prevention

- ▶ Wear light-colored, loose clothing and a hat when going outdoors.
- ▶ Take time to acclimate to hot weather conditions before participating in strenuous activities.
- ▶ Assure adequate hydration and nutrition. Consume water or sports drinks frequently during activities in hot weather even if you do not feel thirsty.
- ▶ Do not take salt tablets which can irritate the stomach or cause electrolyte imbalance.
- ▶ Take frequent rest breaks in shady or air-conditioned areas to cool down.

### Drowning

Drowning, immersion or submersion in a liquid, with or without survival, is most commonly associated with summertime water sports. The typical drowning victim is a child or teenager. Victims usually aspirate water into the lungs but contaminants like algae, sand and mud can lead to pulmonary infection. The outcome of drowning is closely linked to the amount of time the victim was submerged, the degree of hypoxic central nervous system damage, the victim's age, the presence of coexisting illnesses or injuries, and water temperature. Hypothermia may protect cerebral tissues from hypoxic damage by reducing the cerebral metabolic rate. Survival rates are better when submersion occurs in icy cold water, particularly in children when hypothermia occurs

before hypoxia. Events surrounding the drowning incident also play a role. The rescue and emergency care can be complicated if the victim also had a seizure, myocardial infarction, stroke, or head injury.

The immediate priority in management of a drowning victim is effectively ventilating the patient during rescue – an intervention highly correlated with survival. Ideally a flotation device such as a raft or surfboard can be used to enable a safe rescue from the water without jeopardizing other lives. Before attempting a rescue, always consider your own swimming ability as well as any hazards in the environment. Do not attempt a deep water rescue if you are not a capable swimmer. Current guidelines recommend spinal stabilization only for those drowning victims with injury mechanisms highly associated with spinal trauma, such as diving, bodysurfing, and use of water slides. The most important focus now is on ventilating the patient during the rescue. If the victim is potentially hypothermic, gentle handling is crucial to prevent ventricular fibrillation which can lead to cardiac arrest. Do not use abdominal thrusts to clear water out of the airways because it delays effective rescue techniques and may cause vomiting and aspiration. Rescue breathing can achieve ventilation even with water in the lungs. EMS personnel will administer oxygen and apply spinal immobilization if needed and establish an IV access. A victim who survives may experience transient or permanent neurologic damage.

### **Water-related Tragedy Prevention**

- ▶ Continuously supervise children who are in or near the water.
- ▶ Don't drink alcoholic beverages while in or around water.
- ▶ Never swim alone.
- ▶ Do not dive into shallow water or into water of unknown depth; jump in feet first.
- ▶ Have appropriate water rescue equipment including life jackets on boats and around water.

### **Lightning Injuries**

Lightning strikes occur year-round and kill on average 67 people each year in the U.S. and more than 80% of the victims are male. Most lightning-related injuries occur in the summer when thunderstorms are common and more people are outside. Besides directly striking a victim, lightning can kill by splashing or side flashing off a nearby strike area or by traveling through the ground. Less than 1/3 of lightning victims die, but many survivors sustain permanent disabilities. The explosive forces generated by a lightning strike can produce multisystem trauma, including cardiac arrest, numerous craniocerebral injuries and central nervous system effects like paralysis, amnesia, confusion or disorientation, photophobia and seizures, which can be immediate but transient. Talking on a hard-wired telephone during an electrical storm places one at high risk for telephone-mediated lightning injuries and carries the risk of ear drum rupture, blindness, retinal detachment, cataracts and even death. Lightning also produces burn injuries, although most are superficial and heal without incident. Burn injuries usually result from superheated metal objects that are in contact with the victim's skin, such as a belt buckle, jewelry or a cell phone. The burn patterns on skin look like fern or tree like patterns called, *erythematous arborization*. Not all lightning effects are immediately obvious after the initial injury. Possible long term complications include fatigue syndromes, subtle cognitive impairments, and posttraumatic stress syndrome. Please note that lightning strike victims are not electrically charged and pose no danger to rescuers.

Initial emergency care is directed at supporting the ABCs, immobilizing the spine, and providing advance life support. Victims who show signs of life immediately after the strike have the best prognosis. If two victims are involved, the person in cardiac arrest should be the highest priority. The goal is to prevent the second hypoxic cardiac arrest by doing CPR. Begin CPR immediately. Skin mottling and diminished or absent peripheral pulses may occur initially due to arterial

vasospasm as a direct result of the lightning strike but should resolve spontaneously in several hours. The survivor may still have ECG and myocardial perfusion abnormalities. The victim will be further evaluated in the ER, treated and referred to a support group if needed.

### **Lightning Injury Prevention**

- ▶ Get out of the water and seek shelter whenever you hear thunder.
- ▶ Be aware that lightning can strike without warning, even when the sky is clear.
- ▶ Avoid standing near doorways, windows, fireplaces or cave entrances, because these openings attract lightning. Avoid standing near isolated metal sheds.
- ▶ Don't stand under the tallest tree or object in the area – lightning is attracted to the highest point in the area.
- ▶ Don't stand near plumbing fixtures or use a hard-wired telephone. Turn off all electrical equipment and appliances. Cell phones do not conduct electricity but their metal components do and can cause burns.

### **Bee and Wasp Stings**

Reactions to bee and wasp stings can range from local pain to life threatening anaphylaxis. A local reaction to a bee or wasp sting consists of instant pain, followed by a wheal and flare reaction. A number of systemic effects are also possible depending on the victim's degree of sensitivity to the venom – generalized edema, nausea, vomiting and diarrhea. Clinical signs of an allergic reaction include urticaria, pruritus, respiratory distress, hypotension, loss of consciousness, cardiac dysrhythmias, and cardiac arrest.

Removing the stinger is the first priority. The longer the stinger stays in place, the greater the venom absorption. Choose the quickest available method for stinger removal such as scraping with a credit card, knife blade or needle or use tweezers if that is all you have. Tweezers should be used as a last resort because pinching the stinger's venom sac can inject more venom. Apply an ice pack or hold the site under cold running water. An antihistamine may be all that is required if it is a mild reaction with just hives or pruritus. If wheezing, facial edema or respiratory distress develops, then administer epinephrine and call 911.

Once at the hospital, the patient may need oxygen, cardiac and blood pressure monitoring, and IV therapy as well as additional epinephrine. Other medications include albuterol, parenteral antihistamines or corticosteroids to deal with the inflammatory and immune response.

### **Allergic Reaction Prevention**

- ▶ Carry an epinephrine kit or pen at all times and wear a medical alert bracelet.
- ▶ Avoid wearing perfume and dark colors when outside; wearing white is best.
- ▶ Keep screens in windows and doors.
- ▶ Keep lids on trash cans that might attract bees and wasps.

### **Venomous Snakebite**

In the U.S. most of the snakebites are caused by snakes from the Crotalidae family (pit vipers) which includes rattlesnakes, copperheads, and water moccasins. Coral snakes are from the Elapidae family and account for less than 1% of venomous snake bites. Out of the 7-8,000 reported annually, less than 6 people die as a result of a snake bite. Most snakebite fatalities are associated with rattlesnakes. Warm weather causes snakes to become more active. Snakes most often bite when suddenly confronted by someone at close range as a defense mechanism. Pit vipers are recognized by the presence of fangs and triangular head that houses the venom glands.

The first step in treatment is to determine whether the victim has been envenomated. Signs and symptoms depend on the type and amount of venom injected, the bite location, and the victim's age, size and general health. Local manifestations include one or more puncture wounds in the skin, pain, edema, and erythema or ecchymoses adjacent to the bite. Systemic responses include a minty, rubbery, or metallic taste in the mouth; tingling or paresthesias of the scalp, face and lips; muscle fasciculations; nausea; vomiting; hypotension; muscle weakness; seizures and coagulopathies. The first intervention is to move the victim to a safe place away from the snake. Have the victim remain still and in a comfortable position to slow the circulation of venom. To limit spread of the venom, splint and immobilize the affected limb and keep it below heart level. Keep the victim warm and calm. Don't offer alcohol or stimulants such as caffeinated drinks, because these accelerate the absorption of venom. If transport is going to be delayed, consider applying a 2 – 4 cm wide constricting band proximal to the wound to impede lymphatic flow, but not venous drainage or arterial flow. Do not apply the band as tightly as a tourniquet. Some professionals feel that use of a constricting band may worsen local necrosis by holding the venom in the tissues. If a band is applied, it is important to assess distal circulation frequently especially if edema develops. Do not incise and suck the wound or apply ice.

In the hospital the patient will be evaluated with lab work and an ECG. Oxygen therapy, IV therapy and cardiac monitoring, pain management and wound care will be performed. Lab testing includes a CBC, coagulation profile, electrolytes, CK and a urinalysis. A careful patient history will be taken. It is important to get a description of the snake, time of the bite, care rendered in the field and any previous history of snakebites. Measuring the circumference of the bite is important as well as remeasuring every 15 to 30 minutes to assess the progression of edema. The hospital will make the decision on whether or not to administer an antivenom. Antivenom is most effective if administered within 4 hours of the bite but can be used even after 24 hours.

### **Snakebite Prevention**

- ▶ Maintain a keen awareness of snakes and their habitat.
- ▶ Wear boots, protective clothing and heavy gloves in known snake habitats such as swamps, caves, bushes and crevices.
- ▶ Use a walking stick or trekking pole while hiking and hike with a partner.
- ▶ If you see a snake, stay out of its way and do not harass it.
- ▶ Remember a dead or decapitated snake can inflict a bite up to one hour after death.

**REFERENCE: "Summer emergencies", NURSING2010, JUNE, VOL. 40, NO. 6**

## Summertime Hazards – Self-Assessment Quiz

**Please place all answers on the Continuing Education Registration Form.  
Mail form to ABP LLC to be graded so that you can get your P.A.C.E. certificate.**

- 1. Which of the following heat-related illnesses is a true medical emergency?**  
a. heat cramps      b. heat stroke      c. heat exhaustion      d. heat syncope
  
- 2. Which of the following should NOT be done to cool a victim of heat stroke?**  
a. Place ice packs under the victim's armpits.  
b. Spray the victim with a garden hose.  
c. Immerse the victim in cold water.  
d. Immerse the victim in ice cold water to induce shivering.
  
- 3. The typical drowning victim is:**  
a. an infant less than two years old.      c. a geriatric.  
b. a child or a teenager.      d. a person under the influence of alcohol.
  
- 4. Water- related tragedy can be prevented by:**  
a. swimming with a buddy.  
b. drinking for four hours before swimming.  
c. diving head first into water of unknown depth.  
d. making sure life jackets are locked in the boat house.
  
- 5. Which of the following statements is correct about lightening injuries?**  
a. Most victims are female.  
b. Lightening cannot travel through the ground.  
c. Burn injuries can occur from a belt buckle that touches the victim's skin.  
d. Cell phones conduct electricity.
  
- 6. One can prevent lightening injuries by doing all of the following EXCEPT:**  
a. Avoiding standing in a doorway.  
b. Not standing near a toilet or a sink.  
c. Standing under the tallest tree around.  
d. Getting out of the water when you hear thunder.
  
- 7. Which of the following is NOT a clinical sign of an allergic reaction to a bee sting?**  
a. a wheal      b. urticaria      c. hypotension      d. pruritus
  
- 8. Which statement is NOT correct about a bee stinger?**  
a. Tweezers should always be the first choice for stinger removal.  
b. The longer the stinger stays in place the more venom is absorbed.  
c. A credit card can be used to scrape away the stinger.  
d. Stinger removal is always the first priority in treating the victim.

**9. Systemic responses to venomous snake bites includes all of the following EXCEPT:**

- a. metallic taste
- b. hypotension
- c. coagulopathies
- d. ecchymoses

**10. Which statement is correct about snakebites?**

- a. It is important to remeasure the circumference of a snakebite every 24 hours.
- b. It is important to make a cut around the snakebite to prevent its spread.
- c. A dead snake can inflict a bite up to one hour after death.
- d. Antivenom must be administered within 24 hours after a bite to be effective.