

Assessment and Emergency Care of Environmental Emergencies

Scene Size-up

Scene Safety

Ensure scene safety and safe access to the patient. Standard precautions should include a minimum of gloves and eye protection if there is a potential for vomiting. Consider a gown and shoe covers if other bodily fluids are involved. In situations of environmental extremes, ensure that you are wearing appropriate clothing. Determine the number of patients. Assess the need for additional resources, such as a search and rescue team, and summon additional help as quickly as possible.

Mechanism of Injury (MOI)/ Nature of Illness (NOI)

Determine the MOI. Observe the scene and look for indicators that will assist you with this. Interview the patient, family, and/or bystanders to determine the degree of environmental exposure.

Primary Assessment

Form a General Impression

Inquire about the chief complaint and observe the patient's overall condition. In an environmental emergency, your patient's chief complaint may be only that he or she is cold or hot. Determine the level of consciousness using the AVPU scale. The more altered the patient's mental status is, the more serious the problem. Identify immediate threats to life. Determine the priority of care based on the MOI. Pay particular attention to chest pain, dyspnea, and complaints related to sensory changes such as when a diving emergency is suspected. If the patient has a poor general impression, call for ALS assistance. A rapid scan of the patient will help you identify and manage life threats.

Airway and Breathing

Consider the possibility of spinal trauma. Ensure the airway is open, clear, and patent. Evaluate the patient's ventilatory status. Administer high-flow oxygen at 15 L/min, providing ventilatory support as needed. In patients with hypothermia, the oxygen should be warmed, if possible. Hypoxia may cause changes in the patient's mental status. If vomiting is a possibility, place the patient in the recovery position if no spinal injury is suspected.

Circulation

Observe skin color, temperature, and condition; look for life-threatening bleeding and treat accordingly. Evaluate the pulse rate, quality (strength), and rhythm. With severe hypothermia, heart function may be severely depressed, requiring an extended pulse check for accurate determination.

Transport Decision

If the patient has airway, breathing, or circulation problem, signs and symptoms of bleeding, or other life threats, manage them immediately and transport, performing the secondary assessment en route to the hospital. Consider the nature of the environmental emergency when making a transport decision. All patients with hypothermia require immediate transport for evaluation and treatment. If your patient has any signs of heatstroke (high temperature; red, dry skin; altered mental status; tachycardia; poor perfusion), then transport without delay. Patients with decompression sickness and air embolism must be treated in a recompression chamber.

NOTE: The order of the steps in this section differs depending on whether the patient is conscious or unconscious. The following order is for a conscious patient. For an unconscious patient, perform a primary assessment, perform a full-body scan, obtain vital signs, and obtain the past medical history from a family member, bystander, or emergency medical identification device.

History Taking

Investigate Chief Complaint

Investigate the chief complaint. Monitor the patient for changes in mental status. Ask OPQRST and SAMPLE questions. SAMPLE can also be obtained from family, bystanders, and medical alert tags. Ask probing questions specific to the nature of the environmental emergency. Certain medications can impair the body's natural ability to control its internal temperature.

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Secondary Assessment

Physical Examinations

Perform a systematic full-body examination or focused examination to rule out any potential life threats. Assess patients with suspected hypothermia by monitoring body temperature and focus on the areas of the body directly affected by cold exposure and assess the degree of damage. Frostbitten parts should be protected from further damage. Your assessment of the patient's skin will help determine the seriousness of a heat problem. For example, in heat exhaustion, the skin temperature may be normal or may even be cool and clammy; however, in heatstroke, the skin is hot. If a patient has been stung or bitten, locate any stingers or fangs and carefully remove them. Do not delay transport to perform the physical examination at the scene.

Vital Signs

Obtain baseline vital signs as soon as practical. Vital signs should include blood pressure by auscultation, pulse rate and quality, respiration rate and quality, and skin assessment for perfusion. Note the patient's level of consciousness. Use pulse oximetry, if available, to assess the patient's perfusion status. Vital signs may be altered by the effects of hypothermia and can be an indicator of its severity. Patients who are hyperthermic will be tachycardic and tachypneic. Determine a core body temperature using a thermometer based on local protocol.

Reassessment

Interventions

Repeat the primary assessment and reassess vital signs and the chief complaint. Assist breathing as required, administering high-flow oxygen. Replace fluids by mouth for a heat emergency and cool the patient with a cool water spray or mist. For a cold emergency, reassess oxygen delivery and continue to provide a warm environment, removing any wet or frozen clothing.

Communication and Documentation

Contact medical control/receiving hospital with a radio report; many hospitals require additional personnel and a separate treatment area. Include a thorough description of the MOI and the position the patient was found in. Include treatments performed and patient response. Be sure to document the patient's distress, answers to your questions, and any changes in patient status and the time. Follow local protocols. Document the reasoning for your treatment and the patient's response.

NOTE: Although the following steps are widely accepted, be sure to consult and follow your local protocols. Take appropriate standard precautions when treating all patients.

Environmental Emergencies

Cold Exposure Emergency

1. Establish and maintain a patent airway. Provide oxygen. Monitor for vomiting and protect against aspiration.
2. Carefully move the patient to a protected environment. Remove any wet clothing. Place dry blankets over and under the patient.
3. Handle the patient gently to avoid further injury. With severe hypothermia, careful handling of the patient is necessary to prevent cardiac arrest; rough handling can cause ventricular fibrillation.
4. If the hypothermia is mild, begin active rewarming.
5. If the hypothermia is moderate or severe, prevent further heat loss and follow local protocols.

Assessment and Emergency Care of Environmental Emergencies, continued

Environmental Emergencies

Local Cold Injuries

1. Remove the patient from further exposure to the cold.
2. Handle the injured part gently, and protect it from further injury.
3. Administer oxygen.
4. Remove any wet or restricting clothing over the injured part.
5. For superficial local cold injury, consider active rewarming if there is no chance of reinjury. Splint the extremity, and cover it loosely with a dry, sterile dressing.
6. Do not rewarm a late or deep local cold injury unless specifically instructed to do so by medical control. Evaluate for hypothermia. Cover the injured part with soft, padded, sterile cotton dressings.
7. Never attempt rewarming if there is any chance that the part may freeze again.

Heat Cramps

1. Remove the patient from the hot environment. Loosen any tight clothing.
2. Administer high-flow oxygen.
3. Rest the cramping muscles. Have the patient sit or lie down until the cramps subside.
4. Replace fluids by mouth.
5. Cool the patient with cool water spray or mist and manually or mechanically fan the patient.

Heat Exhaustion

1. Remove extra clothing.
2. Move the patient to a cooler environment. Administer oxygen.
3. Place the patient in a supine position, elevate the legs, and fan the patient.
4. If the patient is fully alert, give water by mouth.
5. If nausea develops, transport the patient on his or her side.

Heatstroke

1. Move the patient out of the hot environment and into the ambulance.
2. Set the air conditioning to maximum cooling.
3. Remove the patient's clothing.
4. Administer high-flow oxygen and assist the patient's ventilations if needed.
5. Apply cool packs to the patient's neck, groin, and armpits.
6. Cover the patient with wet towels or sheets, or spray the patient with cool water and fan.
7. Aggressively and repeatedly fan the patient with or without dampening the skin.
8. Provide immediate transport to the hospital and notify the hospital of the patient's condition.

Drowning Injuries

1. Once the patient is removed from the water, ensure a patent and clear airway.
2. Begin CPR if pulse and breathing are absent.
3. If pulse and breathing are present, administer oxygen and assist ventilations if needed.
4. Keep the patient warm and transport.

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Environmental Emergencies

Diving Injuries

1. Remove the patient from the water.
2. Begin CPR if pulse and breathing are absent.
3. If pulse and breathing are present, administer oxygen.
4. Place the patient in a left lateral recumbent position with the head down.
5. Provide prompt transport to the nearest recompression facility for treatment.

Lightning Injuries

1. Move the patient to a sheltered area.
2. Stabilize the patient's head and open the airway with the jaw-thrust maneuver.
3. Those who are conscious following a lightning strike are much less likely to develop delayed respiratory or cardiac arrest; most of these persons will survive. Perform "reverse triage" by focusing your efforts on those who are in respiratory or cardiac arrest.
4. If the patient is in respiratory arrest with a pulse, begin ventilating with a bag-mask device with 100% oxygen. If the patient is in cardiac arrest, attach an automated external defibrillator. Control severe bleeding.
5. Provide full stabilization and transport.

Spider Bites

1. Provide basic life support for respiratory distress.
2. Apply ice to the bite area and clean the wound with soap and water.
3. Transport the patient and, if possible, the spider to the hospital.

Snake Bites

1. Calm the patient and minimize movement.
2. Clean the bite area gently with soap and water or a mild antiseptic. Do not apply ice.
3. Transport the patient and, if possible, the snake to the emergency department.
4. Notify the emergency department that you are bringing in a snake bite victim.

Marine Animal Injuries

1. Limit further discharge of nematocysts by avoiding fresh water, wet sand, showers, or careless manipulation of the tentacles. Keep the patient calm, and reduce motion of the affected extremity.
2. Inactivate the nematocysts by applying vinegar. Isopropyl alcohol may be used if vinegar is not available, but may not be as effective.
3. Remove the remaining tentacles by scraping them off with the edge of a sharp, stiff object such as a credit card. Do not use your ungloved hand to remove the tentacles because self-envenomation will occur. Persistent pain may respond to immersion in hot water (110°F to 115°F, 43°C to 46°C) for 30 minutes.
4. Provide transport to the emergency department.