HIGHLIGHTS

of the 2024 American Heart Association and American Red Cross Guidelines for First Aid

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Introduction

These Highlights summarize the most significant new and updated recommendations from the *2024 American Heart Association and American Red Cross Guidelines for First Aid*.[1] They have been developed for first aid providers and instructors to focus on the science and rationale for the recommendations that will result in changes to first aid training and practice.

These Highlights focus on recommended actions that have significantly changed from previous American Heart Association (AHA)/American Red Cross (Red Cross) first aid guidelines. Because this publication is a summary, it does not reference the supporting published studies and does not list Classes of Recommendation or Levels of Evidence for each recommendation. For more detailed information and references, please read the 2024 guidelines.[1]

To create the *2024 AHA and Red Cross Guidelines for First Aid*, the writing group members first created and approved a list of first aid topics, drawing on the scope of prior guidelines and new topics that have gained prominence since the last complete first aid guidelines were published in 2010.[2] A population, intervention, comparison, and outcome (PICO) question was created for each topic. Evidence-based recommendations were created based on Consensus on Science With Treatment Recommendations from the International Liaison Committee on Resuscitation (ILCOR) and structured evidence evaluations performed by the writing group. The opioid overdose first aid recommendations are based on guidelines provided by the AHA in 2023,[3] which were reaffirmed with additional new evidence and adapted for the first aid provider and setting. The methods used by ILCOR to perform evidence evaluation[4] and by the AHA to evaluate evidence and translate the results of evidence evaluations into first aid guidelines[5] have been published in detail. The ILCOR evidence evaluation process and the AHA and Red Cross guidelines development process are governed by strict disclosure policies designed to make relationships with industry and other conflicts of interest fully transparent and to protect these processes from undue influence.

These guidelines supersede the comprehensive AHA/Red Cross first aid guidelines published in 2010[2] and the focused updates published in 2015,[6] 2019,[7] and 2020.[8] They consist of 179 specific treatment recommendations, organized into 38 modular knowledge chunks.[9] Each recommendation in the guidelines is categorized on the basis of the strength of the recommendation and the level (certainty) of the supporting evidence. These Highlights present the most significant additions and changes contained in the 2024 first aid guidelines.

Topics Covered in the 2024 AHA/Red Cross Guidelines for First Aid

Administration of oxygen
Anaphylaxis
Asthma
Bee and wasp stings
Care of thermal burns after cooling
Chemical exposures to the eye
Chemical exposures to the skin
Chest pain
Concussion
Cooling of thermal burns
Dental avulsion
Epistaxis (nosebleed)
Exertional dehydration
Extremity bleeding not controlled by direct pressure
Fractures
Frostbite
Hyperthermia and heat stroke
Hypoglycemia
Hypothermia
Jellyfish stings
Open chest wounds
Opioid overdose
Poison ivy, poison oak, and poison sumac
Positioning of the ill or injured person
Positioning of the person in shock
Presyncope
Recognition of stroke (adults)
Recognition of stroke (children)
Seizures
Severe external bleeding
Snakebite
Spider and scorpion envenomation
Sprains and strains
Superficial wounds
Suspected foreign body in the eye
Suspected spinal injury
Tick bites
Use of pulse oximetry

First Aid

First aid is defined as helping behaviors and initial care provided for an acute illness or injury.[6] First aid can be provided by anyone, including the ill or injured person (self-care), nearby persons, and trained rescuers with a duty to respond (eg, lifeguards). The scope of first aid provided is based on the first aid provider's level of training, available equipment and resources, the overall scenario, and need. First aid competencies, at every level of training, include the following:

- Recognizing, assessing, and prioritizing the need for first aid
- Providing care by using appropriate knowledge, skills, and behaviors
- Recognizing limitations and seeking additional care when needed

These guidelines are intended to apply to the members of the general public who provide first aid in common residential, workplace, and recreational settings. In general, first aid care begins when the first aid provider begins to assess and assist the ill or injured person and continues until the condition no longer requires urgent intervention, emergency medical service (EMS) professionals arrive, or the person arrives at definitive health care. First aid providers with additional training and duties (eg, lifeguards, industrial safety team members, tactical response team members) are expected to follow their specialized training and protocols.

First Aid Training

The teaching methodology of first aid is crucial. The Learn, See, Practice, Prove, Do, Maintain framework proposed by Sawyer et al[10] begins with *learning*, ideally through multimedia resources, followed by real-life demonstrations (*seeing*). These steps represent a flipped classroom model, enhancing advanced learning tasks in the presence of a teacher and peers. Deliberate *practicing* combines appropriate training frequency, low-risk practice environments, and direct observation for feedback. *Proving* involves employing valid and reliable assessments to ensure effective learning outcomes. *Doing* the work independently and, importantly, *maintaining* first aid skill sets, requires intermittent skill refreshers, termed *spaced learning*, to thwart forgetting. No educational effort perfectly integrates all aspects of the Learn, See, Practice, Prove, Do, Maintain framework, but it serves as a comprehensive guide for educators planning first aid training, covering content, teaching methods, and evaluation strategies.

New First Aid Recommendations

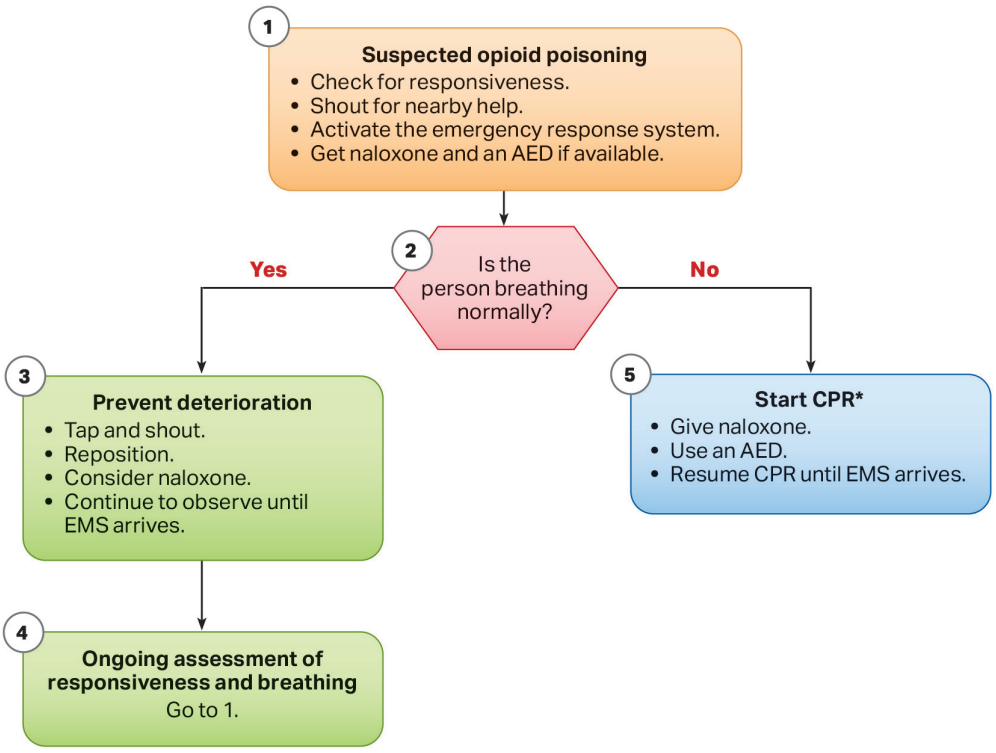
Opioid Overdose

2024 (New): It is beneficial for first aid providers to receive training in responding to opioid overdose, including the provision of naloxone.

2024 (New): A first aid provider who encounters a person with suspected opioid overdose who is unresponsive and not breathing or not breathing normally should activate the emergency response system, provide high-quality CPR (compressions plus ventilation), and administer naloxone.

Why: Opioid overdose is a major cause of preventable death in the United States, Canada, and elsewhere. Although it is currently addressed in adult and pediatric basic and advanced life support training, prior first aid recommendations did not include first aid for opioid overdose. Naloxone reverses the effect of opioid overdose, restoring consciousness and breathing and often preventing cardiac arrest. Naloxone nasal spray is available in the United States and Canada without a prescription. Numerous studies show the benefit of naloxone administration by community members, and rates of naloxone administration increase when community members receive training. Adding opioid overdose treatment, including naloxone administration, to first aid training multiplies the number of community members willing and able to perform this lifesaving skill (Figure 1).

Figure 1. AHA Opioid-Associated Emergency for Lay Responders Algorithm.



*For adult and adolescent victims, responders should perform compressions and rescue breaths for opioid-associated emergencies if they are trained and perform Hands-Only CPR if not trained to perform rescue breaths. For infants and children, CPR should include compressions with rescue breaths.

Recognition of Stroke in Children

2024 (New): If pediatric stroke is suspected, EMS should be activated, and the person should be transported to an emergency department.

2024 (New): It is reasonable to consider stroke when common pediatric symptoms are present in association with other neurological signs and symptoms.

2024 (New): Adult stroke scores are not validated in the pediatric population and should not solely be used to identify the broad presentation of stroke in children.

Why: While previous first aid guidelines have included recognition of stroke in adults, approximately 40 000 children worldwide experience stroke each year. The initial signs and symptoms of stroke in children are often missed, resulting in delayed diagnosis and potentially the missed opportunity to intervene. Although pediatric stroke can present in similar ways to adult stroke, it can also present in nonspecific ways and mimic other childhood diseases (Table 1).

Table 1. Common Signs and Symptoms of Stroke in Children

Focal signs and symptoms
• Hemiparesis
• Limb weakness
• Facial droop
• Altered sensation
• Visual disturbance
• Speech disturbance
General signs and symptoms
• Altered mental status
• Seizure
• Headache
• Ataxia
• Vertigo/dizziness
• Nausea/vomiting

Use of Pulse Oximetry in First Aid

2024 (New): A physical examination and history should be the primary assessment methods for first aid providers to evaluate an ill or injured person.

2024 (New): It is reasonable for first aid providers to use pulse oximetry results in the context of a complete assessment and be aware of the limitations of pulse oximetry before acting on any results.

Why: The use of home pulse oximeters has become widespread since the COVID-19 pandemic. However, these machines may not always be accurate (see Table 2 for device limitations). First aid providers are encouraged to use their foundational assessment skills as the primary way to evaluate an ill or injured person and avoid overreliance on technology.

Table 2. Limitations of Pulse Oximeters

Patient factors
• Chronic respiratory disease
• Nail thickness and nail paint or polish
• Heart rhythm and cardiac output
• Skin thickness, perfusion, pigmentation, and temperature
Device factors
• Battery level/charge
• Device condition, such as being dusty, dirty, or damaged
• Size and orientation of light and sensor
Device accuracy and calibration (Food and Drug Administration categories):
1. Consumer product
2. Home-use medical devices
3. Medical device
Environmental factors
• Extremes of temperature
• Movement or vibration, such as transportation
• Moisture and humidity
• Interference from direct external light sources, including sunlight

Bee and Wasp Stings

2024 (New): If a person experiences anaphylaxis due to a bee, wasp, or hornet sting and an epinephrine autoinjector is available, the person should self-administer the autoinjector.

2024 (New): A first aid provider should assist a person experiencing anaphylaxis to use the auto-injector, if assistance is required.

2024 (New): If a person experiences anaphylaxis due to a bee, wasp, or hornet sting, the emergency response system should be activated.

2024 (New): Stings to the eye should be evaluated by a trained medical professional.

2024 (New): Removal of a stinger remaining in the skin, as soon as possible, by plucking or scraping, can be beneficial.

2024 (New): Over-the-counter oral antihistamines can be used to alleviate local itching.

2024 (New): Topical corticosteroids can be used to alleviate local itching.

2024 (New): It is reasonable to wash the area of a bee, wasp, or hornet sting with soap and water.

2024 (New): Administration of over-the-counter acetaminophen and nonsteroidal anti-inflammatory agents may be considered to alleviate local pain.

2024 (New): Administration of ice or cold packs may be considered for local pain relief.

Why: Bee and wasp stings are very common. While most victims have only local effects such as pain, swelling, and itching, anaphylaxis from bee and wasp stings results in about 60 deaths per year in the United States. Responding to both minor and life-threatening envenomation is an important addition to first aid training.

Tick Bites

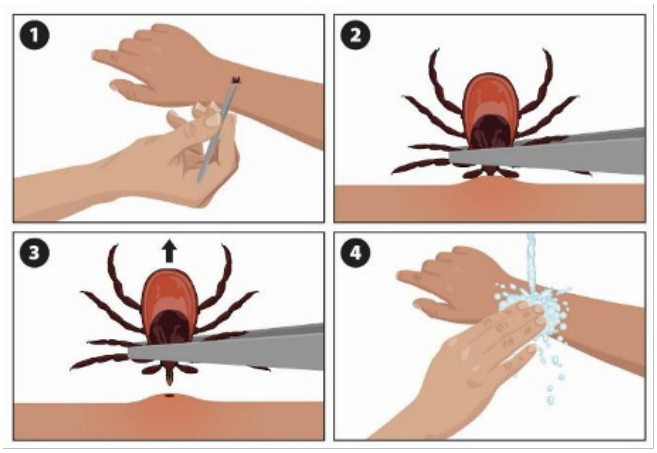
2024 (New): Tick bites occurring in regions with high prevalence of Lyme disease should receive prompt consultation with a health care professional within 72 hours after removal of an engorged tick.

2024 (New): We recommend removal of a tick as soon as possible.

2024 (New): To remove a tick, we recommend grasping the head of the tick as close to the skin as possible with tweezers or a commercial tick removal device and pulling upward with steady, even pressure.

Why: At least 48 000 people are diagnosed with tick-borne illness in the United States annually, and more than 100 000 seek treatment in emergency departments for tick bite exposure. The incidence of tick-borne illness and range of the *Ixodes* tick are increasing. Early removal of the tick (generally within 24-48 hours of attachment) can prevent Lyme disease transmission, but the tick has to be removed properly to successfully extract the tick mouth parts and minimize the risk of infection (Figure 2).

Figure 2. Tick removal.



Reproduced from Centers for Disease Control and Prevention.[11]

Spider Bites and Scorpion Stings

2024 (New): Emergency services should be called if a person bitten by a spider or stung by a scorpion develops symptoms throughout the body, such as difficulty breathing, muscle rigidity, dizziness, or confusion.

2024 (New): A person bitten by a spider or stung by a scorpion should seek medical care if pain extends beyond the site of the bite/sting, becomes severe, and is not controlled by over-the-counter pain medications; if an open wound develops; or if the person experiences symptoms throughout the body.

2024 (New): Over-the-counter acetaminophen and nonsteroidal anti-inflammatory agents can be used to alleviate local pain from scorpion stings.

2024 (New): If the skin is intact, topical lidocaine can be useful to relieve local pain from scorpion stings.

2024 (New): Ice can be useful for local pain relief from scorpion stings.

Why: Bites from black widow and related spiders (genus *Latrodectus*, found throughout the United States [except Alaska] and in southern Canada) cause severe crampy pain, muscle rigidity, diaphoresis, and hypertension. Although a rash is sometimes observed around the bite site, widow spider bites do not cause local tissue injury. Bites from brown recluse and related spiders (genus *Loxosceles*, found in the southern half of the United States) cause painful ulcerated wounds that progress over days to weeks, sometimes associated with hemolysis and rhabdomyolysis. Bark scorpion (*Centruroides*, found in the desert Southwest) stings cause severe localized pain and muscle cramping that may impair breathing in children. The effects of spider and scorpion envenomation vary widely around the world. The 2024 guidelines equip the first aid provider to manage spider bites and scorpion stings occurring in the United States and Canada. Spiders and scorpions in other parts of the world have different venom effects and may require different first aid measures.

Poison Ivy, Poison Oak, and Poison Sumac

2024 (New): As soon as exposure to poison ivy, oak, or sumac is recognized, the exposed area should be washed with soap and water or a commercially available decontamination product.

2024 (New): Cool compresses may be considered for relief of local symptoms from exposure to poison ivy, oak, or sumac.

2024 (New): Oatmeal baths may be considered for relief of local symptoms from exposure to poison ivy, oak, or sumac.

2024 (New): The usefulness of over-the-counter topical steroids to alleviate local symptoms from poison ivy, oak, or sumac is uncertain.

2024 (New): The usefulness of over-the-counter antihistamines to alleviate local symptoms from poison ivy, oak, or sumac is uncertain.

Why: Contact dermatitis from plants in the genus *Toxicodendron* (formerly *Rhus*) is common and results in millions of visits to health care facilities each year. Approximately 50% to 75% of individuals react to urushiol, the allergic compound found in Toxicodendron leaves, stems, and roots. Early skin decontamination can reduce the extent and severity of symptoms. While the usefulness of over-the-counter remedies is uncertain, it is reasonable to try them for symptom relief.

Suspected Foreign Body in the Eye

2024 (New): A person who sustains a high-velocity eye injury (such as injuries from grinding, nailing, or machinery), penetrating eye injury from a sharp or metal object, irregular pupil after trauma, eye bleeding after trauma, or loss of vision after trauma should seek immediate medical attention.

2024 (New): A person who has persistent foreign-body sensation in the eye should seek immediate medical attention.

2024 (New): A person who develops a foreign-body sensation in the eye associated with contact lens use should remove the contact lens, discontinue contact lens use, and seek medical attention.

2024 (New): A person with a foreign-body sensation in the eye should not rub their eye.

2024 (New): Taping a hard plastic shield, paper cup, or plastic cup over the eye can help prevent unintentional touching of the eye.

2024 (New): It is reasonable for a person with a foreign body in the eye from a low-energy mechanism (eg, dust, dirt, other object blown into the eye by wind; eyelash in the eye) to attempt to remove the foreign body by allowing natural tears to wash out the object or by irrigating the eye with tap water or a commercial eye wash solution.

2024 (New): It is reasonable to take over-the-counter oral acetaminophen or nonsteroidal anti-inflammatory drugs to treat residual discomfort after ocular foreign-body removal.

Why: Eye injuries are a common reason people seek treatment in emergency departments. About half of these presentations are due to ocular foreign bodies. A foreign-body sensation can be caused by a loose foreign body (eg, an eyelash or piece of dust or sand), a foreign body embedded on the surface of the cornea, a scratch on the eye, ultraviolet radiation exposure, or a more dangerous condition such as penetrating eye injury, chemical injury, or infection. Ocular foreign bodies are a common workplace injury. While many of these conditions require treatment by a health care professional, low-energy foreign-body injuries can often be safely managed in the first aid setting, and foreign-body removal by natural tearing or gentle irrigation is an important first aid skill.

Nosebleed (Epistaxis)

2024 (New): A person experiencing epistaxis should sit with their head slightly forward with their nostrils pinched for 10 to 15 minutes.

2024 (New): A person experiencing epistaxis that does not stop after 15 minutes of continuous manual pressure or who becomes lightheaded from epistaxis should seek medical attention.

2024 (New): A person with epistaxis due to trauma should seek medical attention if they experience signs of brain injury, obvious nasal deformity, or signs of facial fracture.

2024 (New): It is reasonable for a person experiencing epistaxis who is taking anticoagulant or antiplatelet medication or who has a blood-clotting disorder to seek care from a health care professional unless bleeding has stopped.

2024 (New): The usefulness of cryotherapy (ice) for managing epistaxis in the first aid setting is unknown.

Why: Nosebleeds (epistaxis) may occur spontaneously or as a result of trauma. They are a very common medical condition, responsible for 1 in every 313 emergency department visits in the United States. Most nosebleeds can be treated by pinching and holding the front of the nose for 10 to 15 minutes, potentially avoiding the need for medical care. However, a nosebleed can be a true medical emergency, particularly in older adults and people taking anticoagulant or antiplatelet medications.

First Aid Recommendations With Major Changes

Recognition of Stroke in Adults

2024 (New): If stroke is suspected, the EMS system should be activated immediately.

2024 (New): The use of a stroke recognition scale, such as the Face, Arms, Speech, Time (FAST) or Cincinnati Prehospital Stroke Scale, is recommended to aid in the recognition of acute stroke in adults.

2024 (New): It is reasonable for first aid providers to measure capillary blood glucose in adults with suspected stroke if it is available and does not delay activating EMS.

Why: Stroke is a serious and time-sensitive medical emergency affecting 800 000 people in the United States annually. New data show that the FAST (Figure 3) and Cincinnati Prehospital Stroke Scale can be accurately performed by first aid providers and members of the general public, particularly with coaching from EMS telecommunicators.

Figure 3. The AHA/American Stroke Association FAST stroke recognition tool.

Snake Bite

2024 (Updated): Emergency services should be activated for any person bitten by a venomous or possibly venomous snake.

2024 (Updated): It is reasonable to rest and immobilize the bitten extremity and minimize exertion by the person who was bitten if it does not delay access to emergency medical care.

2024 (Updated): It is reasonable to remove rings and other constricting objects from the bitten extremity.

2024 (Updated): Application of ice to a snakebite wound is of unproven benefit and may be harmful in some situations.

2024 (Updated): The use of suction to treat snake bites is potentially harmful.

2024 (Updated): The application of electric shock to treat snake bites is potentially harmful.

2024 (Updated): The use of tourniquets to treat snake bites is potentially harmful.

2024 (Updated): The use of pressure immobilization bandaging to treat snake bites is potentially harmful.

Why: Approximately 8000 to 10 000 people are treated for snakebite in the United States each year. More than 95% of venomous bites in North America are caused by crotaline snakes (*Crotalinae*, also known as *pit vipers*), specifically rattlesnakes, copperheads, and cottonmouths. Venom from crotaline snakes causes tissue injury and may also cause low blood pressure, bleeding, and disorganized muscle movements leading to paralysis. In the southern United States, bites from coral snakes (*Elapidae*) do not cause tissue injury; coral snake venom is primarily neurotoxic and can cause paralysis within minutes to hours. The definitive treatment for snake envenomation is antivenom, which can only be administered by a health care provider. Many first aid treatments, including application of tourniquets, pressure bandage immobilization, incision, suction, ice application or immersion, and application of electrical current have been advocated with known risks and unclear benefits. These recommendations are specific to snakebites occurring in the United States and Canada and involving snakes native to these areas. Snakes in other parts of the world have different venom effects and may require different first aid measures.

Use of Bronchodilators in Asthma

2024 (Updated): First aid providers should assist a person with asthma who is having difficulty breathing with the administration of their own prescribed bronchodilators, as needed.

2024 (Updated): It is reasonable to use either an inhaler with a spacer or a nebulizer when assisting a person with asthma to use their own inhaled bronchodilator medication, in preference to using an inhaler alone.

2024 (Updated): If a commercially available spacer is not available, it is reasonable to use an improvised spacer when assisting a person who is having an asthma attack to use their own inhaled bronchodilator medication.

Why: While previous first aid guidelines have included recommendations to assist a person having an asthma attack with use of their own bronchodilator medication, the 2024 guidelines strengthen the recommendations to use spacers and include the use of improvised spacers (eg, from a beverage bottle [Figure 4]) when a commercial spacer is not available.

Figure 4. Use of an improvised spacer with a metered dose inhaler.

Seizures

2024 (Updated): First aid providers should activate EMS for individuals with first-time seizure; seizures lasting more than 5 minutes; more than 1 seizure that occurs without the person returning to baseline mental status in between; seizures occurring in the water; seizures with traumatic injuries, difficulty breathing, or choking; seizure in an infant younger than 6 months of age; seizure in pregnant individuals; or if the individual does not return to baseline within 5 to 10 minutes once seizure activity has stopped (Table 3).

2024 (Updated): First aid providers should minimize the risk of injury to the individual who is having a seizure by helping the person to the ground, placing the person on their side in the recovery position, and clearing the area around them.

2024 (Updated): First aid providers should stay with the person having a seizure.

2024 (Updated): For children who have experienced a febrile seizure, administration of antipyretics such as acetaminophen, ibuprofen, or paracetamol is not effective for stopping a seizure or preventing a subsequent febrile seizure.

2024 (Updated): The person having the seizure should not be restrained.

2024 (Updated): Nothing should be put in the mouth and no food, liquids, or oral medicines should be given to a person who is experiencing a seizure or who has decreased responsiveness after a seizure.

Why: Seizures are a common medical condition. Almost 3 million US adults live with epilepsy, and febrile seizures occur in 2% to 4% of children, most commonly between 6 months and 2 years of age. Although seizures are dramatic, many seizures do not require treatment from a health care professional. First aid providers can help by protecting the person experiencing a seizure from injury and calling EMS in appropriate situations. The 2024 guidelines include greatly expanded recommendations for first aid for seizure.

Table 3. Reasons to Activate the Emergency Response System for Seizures

- First-time seizure
- Seizure in an infant <6 months of age
- Seizure lasting >5 minutes
- Seizure in a person who is pregnant
- More than 1 seizure that occurs without return to baseline mental status in between
- Person does not return to baseline within 5-10 minutes after seizure has stopped
- Seizure with traumatic injuries
- Seizure with choking
- Seizure with difficulty breathing
- Seizure occurring in the water

Open Chest Wounds

2024 (Updated): An open chest wound is a medical emergency requiring immediate activation of the emergency response system.

2024 (Updated): If a dressing is placed, the first aid provider should monitor the person for worsening of breathing/symptoms and loosen or remove the dressing if breathing worsens.

2024 (Updated): In the first aid situation, it is reasonable to leave an open chest wound exposed to ambient air, to place a clean nonocclusive, dry dressing (eg, gauze dressing, part of a tee shirt), or place a specialized dressing such as a vented chest seal.

Why: The 2024 guidelines provide expanded guidance for the management of open chest wounds. The goal of sealing an open chest wound is to increase air flow resistance through the wound without causing a tension pneumothorax to form. The guidelines review the literature about chest seals, including animal studies and simulation studies.

Hypothermia

2024 (Updated): A person with signs and symptoms of hypothermia (Table 4) should be protected from further heat loss by moving from the cold environment to a warm one, having saturated clothing removed, being allowed to passively rewarm with blankets, and being actively rewarmed if resources are available.

2024 (Updated): If a person with hypothermia cannot be immediately moved from a cold environment to a warm one, they should be protected from further heat loss by insulation from the ground, covering of head and neck, and shielding from heat loss by wind using a plastic or foil layer in addition to a dry insulating layer.

2024 (Updated): When using rewarming devices of any kind, the first aid provider should follow the manufacturer's instructions for the device used, place insulation between the heat source and skin, and frequently monitor for burns and pressure injury.

2024 (Updated): If a person with hypothermia has a decreased level of responsiveness such as unresponsiveness, inability to remain awake, mumbling speech, confusion, or inability to participate in removal of clothing or has pallor, cyanosis, or frozen skin, the emergency response system should be activated while the person is rewarmed by any available method.

2024 (Updated): For patients experiencing cold stress or mild hypothermia who are alert and can safely consume oral food or fluids, it is recommended to provide high-calorie foods or drinks.

2024 (Updated): If a person with hypothermia with a decreased level of responsiveness is wearing damp (not saturated) clothing such as polyester fleece and cannot be immediately moved into a warm environment, active rewarming through the damp clothing is reasonable to initiate with the hypothermia wrap technique, using chemical heat blankets, plastic or foil layers, and insulative blanket.

2024 (Updated): It is not beneficial to use body-to-body rewarming for active rewarming over other active rewarming techniques such as chemical heat packs or forced air systems.

2024 (Updated): It is not effective to treat a person with hypothermia by using small glove or boot insert chemical heat packs as the sole or primary means of rewarming.

2024 (Updated): Heat sources, rubbing, and massage should not be applied to the extremities of a person with hypothermia.

2024 (Updated): It is potentially harmful to use a warm shower or warm water immersion for rewarming a person with hypothermia with a decreased level of responsiveness (moderate to severe hypothermia) because of the risk of core temperature after drop, hypotension, falls, and drowning.

Why: Accidental hypothermia is an environmental emergency that may be encountered in urban, rural, and austere settings. In the United States, hypothermia is responsible for about 1300 deaths annually. There has been a great deal of study about the most effective ways to prevent and manage hypothermia, including studies comparing different methods of rewarming. The 2024 guidelines draw from the wilderness medicine and mountaineering literature to provide first aid treatment recommendations that are more comprehensive than those found in previous guidelines.

Table 4. Hypothermia Signs, Symptoms, and Potential Rewarming Strategies

Hypothermia level	Signs and symptoms	Rewarming strategies
Cold stress 35-37 °C	• Alert • Possibly shivering	Remove from cold environment; protect from further heat loss. Passive rewarming is often adequate in healthy people.
Mild hypothermia 32-35 °C	• Altered level of responsiveness • Shivering	Protect from harm, such as falls. Passive and active rewarming methods may be used in tandem. Seek additional care.
Moderate hypothermia 28-32 °C	• Decreased level of responsiveness • ± Shivering • ± Low heart rate • Pale, nonblanching exposed skin • Associated with frozen tissue/ frostbite	Hypothermia with decreased responsiveness, such as responding only to loud voice or pain, is a medical emergency. Employ all available passive and active rewarming methods, handle the patient gently, and activate the emergency response system.
Severe hypothermia <28 °C Profound hypothermia <24 °C	• Unresponsive, may appear lifeless • Cessation of shivering • Slow heart rate and breathing • High risk for irregular heart rhythm and cardiac arrest	

Frostbite

2024 (Updated): The preferred method for warming frostbitten tissue is clean lukewarm water immersion at 37 to 40 °C (99-104 °F).

2024 (Updated): Frostbitten tissue should be rewarmed at the earliest opportunity, as long as there is no risk of refreezing.

2024 (Updated): If clean lukewarm water immersion is not feasible, frostbitten tissue should be allowed to rewarm spontaneously in warm room air or next to the person's own warm skin.

2024 (Updated): A person with frostbite should seek prompt medical attention.

2024 (Updated): Jewelry or other constricting materials should be removed from a frostbitten extremity as soon as possible.

2024 (Updated): A person with moderate to severe hypothermia should receive core rewarming before frostbite is treated.

2024 (Updated): If possible, a person should protect frostbitten tissue from further injury and avoid walking on frozen feet and toes.

2024 (Updated): For frozen and thawed tissue and between the toes and fingers, bulky, clean, and dry gauze or sterile cotton dressings should be applied. Circumferential dressings should be wrapped loosely to allow for swelling without placing pressure on the underlying tissue.

2024 (Updated): It may be reasonable to give ibuprofen to a person with frostbite to prevent further tissue damage and to treat pain.

2024 (Updated): It is not recommended for first aid providers to debride blisters associated with frostbite.

Why: Frostbite injury can permanently damage tissue and can lead to digit or limb loss. Frostbite may occur in populated or remote areas; because rewarming and refreezing worsens injury, treatment of frostbite can vary depending on the setting. The 2024 guidelines for frostbite first aid greatly expand the detail in these recommendations.

Oral Rehydration of Exertional Dehydration

2024 (Updated): In the absence of shock, confusion, or inability to swallow, first aid providers should assist or encourage individuals with exertional dehydration to orally rehydrate with any available rehydration drink or potable water.

2024 (Updated): It is reasonable to choose 4% to 9% carbohydrate-electrolyte drink over potable water, 0% to 3.9% carbohydrate-electrolyte drinks, coconut water, or low-fat cow's milk, if each is readily available.

Why: This was updated on the basis of new information demonstrating that fluid from 4% to 9% carbohydrate-electrolyte drinks is generally retained better than other oral rehydration options.

Jellyfish Stings

2024 (Updated): A first aid provider should observe a person with a jellyfish sting for systemic reaction and call emergency services for difficulty breathing, signs of shock, or severe pain.

2024 (Updated): It is reasonable to remove any remaining tentacles by lifting or pulling while avoiding manual contact. Rinsing the affected area with seawater to remove the tentacle is a reasonable alternative if mechanical removal is not available.

2024 (Updated): After removal of tentacles, it is reasonable to use non-scalding hot water immersion/irrigation or to apply a heat source to relieve pain.

2024 (Updated): Topical lidocaine cream or gel may be reasonable for pain control if hot water is not available.

Why: Jellyfish stings occur in coastal areas worldwide and involve animals from many different genera. Although studies of first aid treatment for jellyfish sting vary widely, the overall goal is to remove or deactivate nematocysts and decrease pain. In this updated review, no consistently positive data were found for the application of hot water, vinegar, baking soda, urine/urea, meat tenderizer/papain, or other commonly advocated first aid interventions. Mechanical removal of tentacles (eg, using tweezers) is now first-line therapy. Informed by a 2016 Red Cross scientific review[12] and critical review of more recent literature, the 2024 guidelines are more narrow in their scope than previous guidelines, and focus on nematocyst removal followed by interventions for pain control.

Care of Thermal Burns After Cooling

2024 (Updated): A person with a full-thickness burn or with a partial-thickness burn that is larger than the person's palm or involves the person's face, hands, feet, or genitals, should promptly seek evaluation by a health care professional.

2024 (Updated): For a person with evidence of smoke inhalation injury, such as facial burns, difficulty breathing, singed nasal hairs, or soot around the nose or mouth, EMS should be activated.

2024 (Updated): A person with thermal burns should promptly remove all jewelry, belts, and other tight items from burned areas.

2024 (Updated): It is reasonable to give over-the-counter pain medications for pain from thermal burns.

2024 (Updated): After cooling, for small partial-thickness burns being managed at home, it may be reasonable to apply petrolatum, petrolatum-based antibiotic ointment, honey, or aloe vera and a clean nonadherent dressing to open burn wounds.

2024 (Updated): After cooling, while awaiting evaluation by a health care professional, it may be reasonable to loosely cover a burn that has intact skin or an intact blister with a clean cloth or nonadherent dry dressing.

Why: While the recommendations for initial thermal burns are substantially unchanged since 2015, the 2024 recommendations incorporate best practices for the treatment of minor burns, including the use of topical therapy that creates a good environment for wound healing.

Dental Avulsion

2024 (Updated): When a permanent tooth becomes avulsed (knocked out), initial actions include removing visible debris from the tooth by brief rinsing (less than 10 seconds), taking care not to damage the tooth or attached tissue, and attempting to replant the tooth in the socket.

2024 (Updated): When a permanent tooth is avulsed, the person should seek dental or medical care immediately. They should bring the tooth if not successfully replanted.

2024 (Updated): If an avulsed permanent tooth cannot be immediately replanted, it can be beneficial to place the tooth in Hanks Balanced Salt Solution, oral rehydration salt solutions, propolis, or rice water, if preprepared, or to wrap the tooth in cling film to prevent dehydration.

2024 (Updated): If an avulsed permanent tooth cannot be immediately replanted and the aforementioned solutions or interventions are not available, storage of the tooth in cow's milk or saliva may be considered.

2024 (Updated): If an avulsed permanent tooth cannot be immediately replanted and none of the above storage mediums are available, a probiotic, egg white, or almond milk may be considered.

2024 (Updated): An avulsed permanent tooth should not be stored in tap water.

Why: Although the principles of tooth care and rapid reimplantation are unchanged, the 2024 guidelines provide a rank-ordered list of possible storage media (Table 5) to preserve the cells in the periodontal ligaments, which are essential for successful reimplantation.

Table 5. Storage Media Options for an Avulsed Tooth

First choice (highest rate of reimplantation success)
• Hanks Balanced Salt Solution • Oral rehydration salt solutions • Propolis solution (10%, 50%, or 100%) • Rice water (preprepared) • Wrapping in cling film
Second-line options
• Cow's milk (any fat content) • The person's saliva
Third-line options
• Another person's saliva • Probiotic media (eg, probiotic yogurt, *Lactobacillus reuteri* solution) • Egg white • Almond milk

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