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ADULT FIRST AID | CPR AED

student book
Ver. 9.0, 2021

Adult First Aid | CPR AED

Student Book, Version 9.0, 2021

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Adult First Aid | CPR AED Student Book

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About this Student Book

HSI is in the process of transitioning all our individual health and safety training brands into a single unified one – HSI. This Student Book consolidates the CPR AED and first aid training programs of American Safety and Health Institute (ASHI), EMS Safety Services, and MEDIC First Aid into a single, completely revised Adult First Aid | CPR AED training program that incorporates the most current guidelines and treatment recommendations. To address the risk of confusion in the market and among state regulators and others during our brand transition, HSI's CPR AED and first aid certification cards will continue to carry the ASHI, EMS Safety, and MEDIC First Aid logos for a prolonged period of time until they are slowly phased out.

DISCLAIMER

HSI has used reasonable effort to provide up-to-date, accurate information that conforms to generally accepted treatment recommendations at the time of publication. These recommendations supersede recommendations made in previous HSI programs. Science and technology are constantly creating new knowledge and practice. Like any published material, this material may become out of date over time. Guidelines for safety and treatment recommendations cannot be given that will apply in all cases/scenarios as the circumstances of each incident often vary widely. Local or organizational physician-directed medical protocols may supersede treatment recommendations in this program. Alert emergency medical services (EMS) or activate your occupational emergency action plan (EAP) immediately if you are not sure an emergency exists or when any person is unresponsive, badly hurt, looks or acts very ill, or quickly gets worse.

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NOTICE: *This HSI Training Program has been approved by the HSI Medical Board and reviewed by the HSI Advisory Council. It reflects the latest first aid and resuscitation science and treatment recommendations of the 2020 International Consensus on Cardiopulmonary Resuscitation (CPR) and Emergency Cardiovascular Care (ECC) Science with Treatment Recommendations (CoSTR) and the 2020 International Consensus on First Aid Science with Treatment Recommendations published by the International Liaison Committee on Resuscitation (ILCOR). It conforms with the 2020 American Heart Association®, Inc. (AHA) Guidelines Update for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiovascular Care (ECC), the 2020 AHA and American Red Cross (ARC) Focused Update for First Aid, and annual Guidelines Update. This HSI Training Program incorporates AHA recommendations regarding resuscitation education science (Cheng 2018) and reflects established models, theories, and principles of instructional design and training development that have been integrated into HSI training program brands for more than 40 years. HSI is a nationally accredited organization of the Commission on Accreditation of Pre-Hospital Continuing Education (CAPCE) and nationally approved by the Academy of General Dentistry (AGD) Program Approval for Continuing Education (PACE) as a continuing dental education (CDE) provider.*

This training program is dedicated to every first aid and/or CPR AED provider who voluntarily chooses to aid another in need. Such an unselfish choice is an inspiring act of human kindness.

For that, we appreciate and admire you.

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USING THIS STUDENT BOOK

This Adult First Aid | CPR AED Student Book contains the information you'll need to understand to provide lifesaving first aid and cardiopulmonary resuscitation (CPR) in an emergency. You will practice many of these important skills during your class with the assistance and supervision of an authorized HSI Instructor. If you demonstrate achievement of the required knowledge and hands-on skills for the class type that you participate in, your instructor will issue an authentic HSI certification card valid for two years. This Student Book covers nine different class types and certifications. They are:

1. ADULT FIRST AID | ADULT CPR AED
2. ADULT FIRST AID | ADULT, CHILD, AND INFANT CPR AED
3. ADULT FIRST AID | ADULT AND CHILD CPR AED
4. ADULT FIRST AID | ADULT AND INFANT CPR AED
5. ADULT FIRST AID
6. ADULT, CHILD, AND INFANT CPR AED
7. ADULT AND CHILD CPR AED
8. ADULT AND INFANT CPR AED
9. ADULT CPR AED

You may see information covered in this Student Book that was not a part of your training, depending on your class type and certification. HSI provides this informational Student Book for all participants to encourage knowledge and skill retention related to training, and to provide some additional information for those who are interested. To learn more, consider additional training with HSI in first aid and CPR AED skills.

INTRODUCTION

Medical emergencies can happen anywhere, at any time. There are over 100 million emergency department visits in the United States every year, 35 million for injuries alone.[1] Every year, thousands of workers die on the job.[2] Millions of workplace injuries and illnesses occur in private industry every year. While some of these injuries and illnesses can be treated, prevention of illness and injury is always better. A healthy lifestyle combined with a commitment to safety at work, home, and play can prevent many needless disabling injuries, illnesses, and deaths.

However, once an injury or sudden illness has occurred, effective first aid can save lives, prevent permanent disability, and improve recovery. Trained first aid providers have a vital role in delivering this care during the first minutes of a medical emergency, before emergency medical services (EMS) providers arrive and take over.

Definitions

First Aid. The initial care provided for an acute illness or injury. The goals of first aid include preserving life, alleviating suffering, preventing further illness or injury, and promoting recovery. First aid can be initiated by anyone in any situation, including self-care.[3]

First Aid Provider. Someone trained in first aid who can recognize, assess, and prioritize the need for first aid, as well as provide care by using appropriate skill competencies. A first aid provider recognizes their own limitations and seeks additional care when needed.[4]

Automated External Defibrillator (AED). A portable, life-saving device designed to treat people experiencing sudden cardiac arrest—a medical condition in which the heart stops beating suddenly and unexpectedly. The combination of CPR and early defibrillation with an AED is effective in saving lives when used in the first few minutes following collapse from sudden cardiac arrest.

Conventional Cardiopulmonary Resuscitation (CPR). An emergency procedure that combines chest compressions with artificial ventilation to circulate oxygenated blood to the brain and heart, increasing the possibility of successful resuscitation. It is performed by a trained CPR provider. A first aid provider may or may not be trained in conventional CPR, and a CPR provider may or may not be trained in first aid.

Designated First Aid Provider. An employee formally trained in first aid and/or CPR AED and identified, expected, or directed by the employer as responsible for rendering medical assistance as part of their job duties.

1 https://www.cdc.gov/nchs/fastats/emergency-department.htm [Retrieved 5/21/2021]

2 https://www.CPR.gov/news.release/cfoi.nr0.htm[Retrieved 5/21/2021]

3 Singletary EM, et al. 2020 International Consensus on First Aid Science with Treatment Recommendations. Circulation. 2020 Oct 20;142(16_suppl_1):S284-S334. [Retrieved 5/10/2021]

4 Singletary EM et al. Part 9: First Aid: 2015 International Consensus on First Aid Science with Treatment Recommendations. Circulation. 2015 Oct 20;132(16 Suppl 1):S269-311. [Retrieved 5/10/2021]

UNIVERSAL CONCEPTS

Universal concepts cover broad principal themes that underlie and influence both first aid and CPR AED instruction as well as actual care. These universal concepts are explained on the following pages.

Procedure for Adult First Aid | CPR AED

A procedure is "a particular way of accomplishing something or of acting."[5] The *Procedure for Adult First Aid, CPR AED* is a step-by-step diagram with instructions that provide guidance for assessing, prioritizing, and performing first aid and CPR AED. The *Procedure for Adult First Aid, CPR AED* is modeled after "decision tree" type medical algorithms and is based on scientific evidence, national guidelines, and the consensus of experts. For more on the *Procedure for Adult First Aid, CPR AED*, see Assessment.

Infection Control

The global pandemic of the coronavirus disease 2019 (COVID-19) has resulted in widespread infection and death worldwide. While the introduction of FDA-approved vaccines in the United States and other countries is an encouraging step to ending this global ordeal, infection control practices cannot be overemphasized for all workplace first aid and/or CPR AED providers.

The federal Occupational Safety & Health Administration (OSHA) defines Universal Precautions as "an approach to infection control which treats all human blood and other potentially infectious materials as if they were known to be infectious for the human immunodeficiency virus (HIV), hepatitis B virus (HBV), or other bloodborne pathogens."

There are other concepts in infection control that are acceptable alternatives to Universal Precautions, such as Standard Precautions. These methods define all body fluids and substances as infectious and incorporate not only the fluid and materials covered by the OSHA Bloodborne Pathogens Standard (*1910.1030*) but expand coverage to include *all* body fluids and substances.[6]

Hand hygiene and the use of appropriate personal protective equipment (PPE) are fundamental elements of infection control that must be used by designated first aid providers as part of their job duties.

The phrase "take Standard Precautions" is used throughout this program as one of the first and necessary actions of a designated first aid and/or CPR AED provider. To *take standards precautions* means to use appropriate PPE to protect against possible exposure to infection. This may include gloves, gowns, surgical masks, respirators, eye protection (goggles/face shield), and CPR masks – preferably with a one-way valve incorporating a high-efficiency particulate air (HEPA) filter. Using a CPR mask with a HEPA-rated filter helps keep providers safe by preventing the spread of viruses.

It is the employer's responsibility to evaluate the task and the type of exposure expected, and then to select and supply the appropriate PPE. Experience putting on and taking off PPE, also called donning and doffing, is critical for the safety of designated first aid providers and helps to minimize potential delays in first aid.

Designated first aid providers should frequently train and practice with their employer-provided PPE and established procedures. The responsibility for providing, laundering, cleaning, repairing,

5 "Procedure." *Merriam-Webster.com Dictionary*. https://www.merriam-webster.com/dictionary/procedure [Retrieved 8/2/2021].

6 Standard Precautions for All Patient Care. Available: https://www.cdc.gov/infectioncontrol/basics/standard-precautions.html [Retrieved 2/3/2021]

PROCEDURE FOR ADULT FIRST AID | CPR AED

PERFORM AN ASSESSMENT

- Assess **Scene Safety**
- Take Standard Precautions*
- Assess **Responsiveness**
- Activate **EMS** and/or **EAP**†
- Send Someone to Get a First Aid Kit & AED (unless readily available to you)

ASSESS BREATHING FOR NO MORE THAN 10 SECONDS

RESPONSIVE, BREATHING

OBTAIN CONSENT

- Introduce yourself and ask, "May I help you?"
- Assess for life-threatening conditions.‡ If present, immediately provide appropriate first aid.
- If person shows signs of shock and has no difficulty breathing, keep them lying down, face up.

PERFORM A SECONDARY ASSESSMENT

- Ask the person to describe the current problem.
- Look for medical identification jewelry.
- Visually assess an injured person from head to toe. Look for Deformities and Open injuries. Ask about Tenderness and Swelling. (DOTS)
- Provide appropriate first aid for any problems found.

UNRESPONSIVE, BREATHING NORMALLY

MAINTAIN AN OPEN AIRWAY

- Place an uninjured, unresponsive person on their side in the recovery position to help protect the airway.
- Assess for life-threatening conditions.‡ If present, immediately provide appropriate first aid.
- Give naloxone for suspected opioid overdose (if available).

UNRESPONSIVE, NOT BREATHING NORMALLY OR ONLY GASPING

START CONVENTIONAL CPR

- Position person on a firm, flat surface.
- Perform cycles of 30 high-quality chest compressions and 2 rescue breaths.§
- If another trained CPR provider is available, take turns performing compressions. Switch quickly, about every two minutes.
- Give naloxone for suspected opioid overdose, but do not delay CPR AED to give it.

UNRESPONSIVE. NOT BREATHING NORMALLY . USE THE AED AS SOON AS IT IS AVAILABLE. APPLY PADS TO PERSON'S BARE CHEST. FOLLOW AED PROMPTS.

SHOCK ADVISED?

YES

- Clear the person.
- Give 1 shock.
- Immediately resume high-quality CPR.
- Follow AED prompts.

NO

- Immediately resume high-quality CPR.
- Follow AED prompts.

CONTINUE UNTIL OTHER CPR OR EMS PROVIDERS TAKE OVER OR THE PERSON STARTS RESPONDING (BREATHING, MOVING, REACTING).

* Use appropriate personal protective equipment (PPE) to protect against possible exposure to infectious agents. PPE may include gloves, goggles or face shields, surgical masks, gowns, respirators, and CPR masks. Wash your hands immediately after removing gloves.

† If you are not sure an emergency exists or when any person is unresponsive, badly hurt, looks or acts very ill, or quickly gets worse - call 911 to activate Emergency Medical Services (EMS) using a mobile device and/or activate your emergency action plan (EAP). Listen to the dispatcher's instructions.

‡ Including severe external bleeding, shock, altered mental status, breathing difficulty, choking, severe allergic reaction, stroke, and chest pain or discomfort.

§ For adults and teens in cardiac arrest, untrained bystanders and trained CPR providers should at a minimum provide compression-only CPR, with or without dispatcher assistance. If willing and able, trained CPR providers should perform conventional CPR at ratio of 30 compressions to 2 rescue breaths. In the case of drowning, begin with 2 rescue breaths.

replacing, and disposing of PPE at no cost to employees rests with the employer.[7]

This training program is intended to reinforce infection prevention practices. It is not an infection control training curriculum. It is not intended for meeting any occupational licensing regulations or requirements for infection control training, including the OSHA Bloodborne Pathogens Standard, and should not be used for that purpose. Comprehensive training in infection control is vital to make appropriate decisions in each employee's occupational setting.

First Aid, CPR AED Continuum

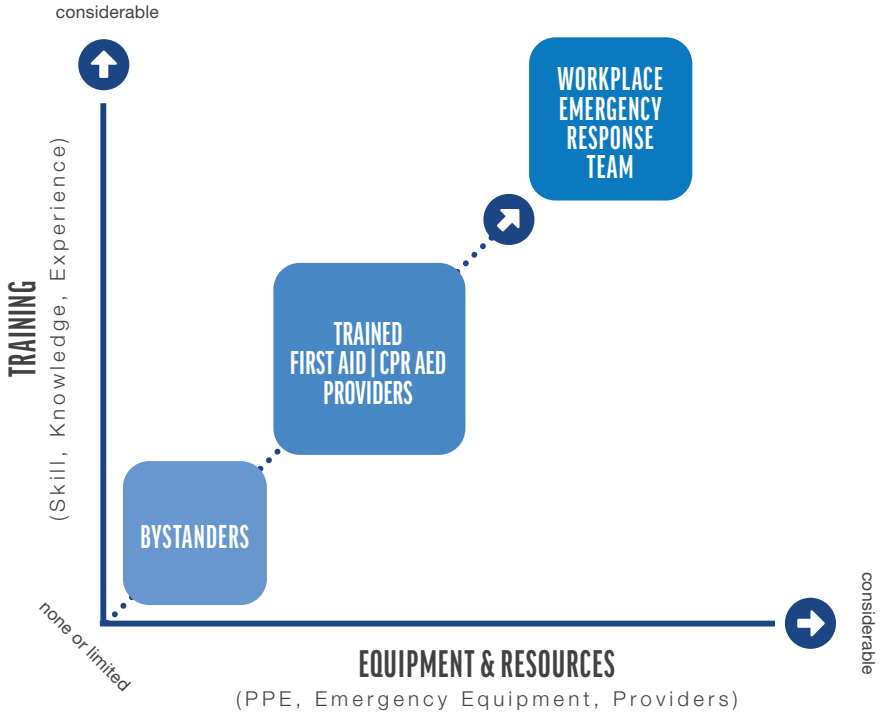
What is done for a suddenly ill or injured person and how it is done often exist on a continuum, "a set of things on a scale, which have a particular characteristic to different degrees."[8] The continuum in first aid, CPR AED can be represented by a linear scale on two axes. On the on the horizontal axis is equipment and resources. On the vertical axis is training (Fig. 2). Each axis begins at "none or limited" and scales up to "considerable."

On one end of the continuum is an untrained layperson bystander. This person has little or no skill, knowledge, or experience in first aid and/or CPR AED, no PPE, and no emergency equipment. Even so, this person can play a critical role in the EMS system by recognizing an emergency, calling 911, and following the dispatcher's instructions, which typically includes encouragement to perform simple first aid, including compression-only CPR.

Trained first aid and/or CPR AED providers represent the middle ground of the continuum and are the primary focus of this training program. Trained first aid and/or CPR AED providers possess the necessary first aid skills, knowledge, and experience to perform assessments and first aid interventions using PPE and a minimal amount of medical equipment including dressings and bandages, tourniquets, epinephrine autoinjectors, CPR masks, and AEDs.

On the high end of the continuum is the Emergency Response Team (ERT), also called incident response teams. These are thoroughly trained groups of people with considerable skill, knowledge, and experience. They train, prepare, and are designated to respond to workplace emergencies, such as fires or explosions, medical emergencies, natural disasters, and hazardous material spills. ERT members have well-established communication systems and protocols and site-specific response procedures. ERT members may be trained in the use of various types of fire extinguishers, self-contained breathing apparatus, plant shutdown procedures, chemical spill control procedures, search and emergency rescue procedures, hazardous materials response, first aid, CPR, and basic or advanced life support. ERT members are typically not licensed healthcare providers, though they may be.

Wherever a first aid provider is on the continuum, each person possesses the ability to help alleviate suffering, prevent permanent disability, and preserve life, sometimes even their own.



7 OSHA Standard Interpretations. Most frequently asked questions concerning the bloodborne pathogens standard. Available: https://www.osha.gov/laws-regs/standardinterpretations/1993-02-01-0 [Retrieved 5/11/2021]

8 "Continuum." https://www.collinsdictionary.com/us/dictionary/english/continuum [Retrieved 1/5/2021]

Barriers To Action

In first aid and CPR AED, barriers to action are psychological or physical obstacles to providing first aid or CPR AED to a person in need.

Bystander Effect

A phenomenon called the "bystander effect" occurs when as few as four other people are present and bystanders become hesitant to step forward in an emergency. When one person does not act, this is seen by the others as a decision that whatever is taking place is not an emergency. [9]

As a trained first aid provider, it's normal to feel hesitant. When others are present, this natural hesitancy may be heightened. It's important to recognize this hesitancy, but not let it stop or slow you from helping. If it is safe to do so, and you have the person's implied or expressed consent (see Legal Concepts), you should act — even when you are not sure that an emergency exists. Taking quick, effective action can potentially save the life of a loved one, a colleague, or ever a stranger.

Fear

Another common barrier to action in an emergency is fear. These fears include fear of legal action, fear of disease transmission, and the fear of doing the wrong thing and hurting someone.[10,11] Good Samaritan laws are intended to encourage people to help others in an emergency without having to worry about being sued (see Legal Concepts).

In the workplace, fears of disease transmission can be alleviated by appropriate vaccination, good hand hygiene, and the use of PPE. If a first aid provider finds themselves in a public setting without proper PPE, particularly in pandemic settings where virus transmission rates are high or when a person appears to have an infectious disease (experiencing fever, coughing, shortness of breath, diarrhea, fatigue, or muscle aches), use physical distancing (sometimes called social distancing) measures. Assist the person from a safe distance the best that you can, for example, by explaining the proper first aid care they can do for themselves, if capable.

If a CPR provider finds themselves unexpectedly confronted by a person in cardiac arrest, has limited or no PPE, and is unwilling to provide rescue breathing out of fear the person may have an infectious disease, the provider can still help the person by providing compression-only CPR.

As to the fear of doing the wrong thing and hurting someone, proper training provides the ability to use first aid knowledge and skills confidently and effectively. Learning, practicing, and using step-by-step procedures for handling life-threatening conditions will help you develop the necessary competency in first aid to help (not harm) a person in need.

When it comes to CPR, various chest compression-associated injuries have been reported, including rib and breastbone fractures and injuries to heart, lungs, and soft tissue of the neck.[12] Still, a person in cardiac arrest is without a heartbeat and breathing. CPR is potentially lifesaving. Injuries from performing it do not make a person without a heartbeat and breathing "worse." **Any type of CPR is associated with doubled survival rates in comparison with no CPR.**[13]

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9 Darley JM, Latané B. Bystander intervention in emergencies: diffusion of responsibility. *J Pers Soc Psychol*. 1968 Apr;8(4):377-83.

10 Bouland AJ, et al. Evaluating Barriers to Bystander CPR among Laypersons before and after Compression-only CPR Training. Prehosp Emerg Care. 2017 Sep-Oct;21(5):662-669. doi: 10.1080/10903127.2017.1308605. Epub 2017 Apr 19. PMID: 28422540 [Retrieved 11/29/21]

11 Jiang Y, Wu B, Long L, Li J, Jin X. Attitudes and willingness toward out-of-hospital cardiopulmonary resuscitation: a questionnaire study among the public trained online in China. BMJ Open. 2020 Oct 8;10(10):e038712. doi: 10.1136/bmjopen-2020-038712. PMID: 33033095; PMCID: PMC7545623. [Retrieved 11/29/21]

12 Righi FA, Jenkins S, Lin PT. Nonskeletal injuries related to cardiopulmonary resuscitation: An autopsy study. J Forensic Sci. 2021 Nov;66(6):2299-2306. doi: 10.1111/1556-4029.14791. Epub 2021 Jul 12. PMID: 34250595. [Retrieved 11/29/21]

13 Riva G, et al. Survival in Out-of-Hospital Cardiac Arrest After Standard Cardiopulmonary Resuscitation or Chest Compressions Only Before Arrival of Emergency Medical Services: Nationwide Study During Three Guideline Periods. Circulation. 2019 Apr 1. doi: 10.1161/CIRCULATIONAHA.118.038179. [Retrieved 11/29/21]

Emotional Considerations

Caring for someone in an emergency can create emotional distress. Exposure to an extreme situation or having a close relationship with those involved can intensify these feelings. Common reactions include the following:

- Anxiety
- Trembling or shaking
- Sweating
- Nausea
- Fast breathing
- Pounding heartbeat

This is a normal human reaction to a traumatic event. Calm yourself as best you can and acknowledge your limitations. When an emergency is over, a first aid provider is often left alone while the ill or injured person is quickly transported away by EMS. With limited time for closure, you may begin to experience a variety of reactions. These may include the following:

- Feeling abandoned or helpless
- Recalling the event over and over
- Self-doubt about not doing enough
- Difficulty concentrating
- Heaviness in the chest
- Upset stomach or diarrhea
- Difficulty sleeping or nightmares

These feelings are normal and should pass with time. However, there are actions you can take to help work through the difficulty:

- Share your feelings.
- Talk with someone you trust to listen without judgment, such as a family member, friend, or coworker.
- Get back to a normal routine as soon as possible.

Accept that it will take time to resolve these emotions. If unpleasant feelings persist, formal assistance from a professional counselor may be helpful as you deal with your emotions about the event.

LEGAL CONCEPTS

There are relevant legal concepts that all first aid and CPR providers need to be familiar with.

Duty to Rescue[14,15]

Duty to rescue is a concept in law that refers to the duty of a person to rescue another who is in a dangerous situation. In the U.S., in general circumstances, there is no duty to rescue. A person cannot be held liable for doing nothing while another person is in peril. However, there are certain situations where a person may have legal duty to provide aid to an ill or injured person. For example, the driver of a vehicle involved in a crash resulting in an injury or death of any person would have that duty. Some people, by the nature of their occupation, have a legal duty to provide first aid. This includes firefighters, law enforcement officers, lifeguards, schoolteachers, and others.

Good Samaritan Definition[16]

A Good Samaritan is defined as "one who voluntarily renders aid to another in distress although under no duty to do so."

Good Samaritan Laws

All 50 states and the District of Columbia have statutes that provide immunity from liability for people who assist others; these are called "Good Samaritan" laws. They are intended to encourage people to help others in an emergency without having to worry about being sued. Good Samaritan laws generally apply to any person who voluntarily comes to the aid of an ill or injured person and acts as an ordinary reasonably prudent person would have acted under the same or similar circumstances. Although these laws vary from state to state, they typically require these circumstances to apply:

- The situation is an emergency.
- Any aid is voluntarily given.
- The victim must give consent whenever possible.
- The aid must be given free of charge and in good faith.
- The aid cannot be "grossly negligent."

Grossly negligent means a lack of care that demonstrates reckless disregard for the safety or lives of others, which is so great it appears to be a conscious violation of other people's rights to safety. It is more than simple carelessness.[17] To locate state Good Samaritan laws, search the internet for "Good Samaritan Act; immunity from civil liability, [state]" – where "[state]" is the state law desired.

14 "Duty to Rescue." https://definitions.uslegal.com/d/duty-to-rescue/ [Retrieved 5/18/21]

15 "Duty to Rescue." https://www.findlaw.com/injury/accident-injury-law/specific-legal-duties.html [Retrieved 5/18/21]

16 *"Good Samaritan."* https://www.merriam-webster.com/dictionary/Good%20Samaritan [Retrieved 5/18/21]

17 "Gross Negligence." https://www.law.cornell.edu/wex/gross_negligence [Retrieved 5/20/21]

Consent

To provide first aid care for someone in an emergency, you must have their consent, meaning their approval or agreement. Consent comes in two forms: expressed or implied.

Expressed Consent

Expressed consent can be given verbally, in writing, or non-verbally (for example, when a person nods their head to agree when asked "May I help you?") Don't touch or give first aid to a conscious adult who objects to it.

Implied Consent

Consent is implied when circumstances would lead a reasonable person to believe that consent *would* be given but it was not directly expressed. Implied consent in an emergency usually occurs when you're unable to communicate with the person, such as if someone is unresponsive. The assumption is that they would ask for help if they were able to.

Confidential Medical Information

Employers are legally obligated to keep certain employee records private. For example, the Americans with Disabilities Act requires employers who have disability-related medical information about an employee to treat that information as a confidential medical record. However, this information may be disclosed to first aid and safety personnel, when appropriate, if the disability might require emergency treatment.[18] If you learn confidential medical information in your role as a first aid provider, it is your responsibility to keep it confidential.

Assault and Battery

The crimes of assault, assault and battery, and aggravated assault all involve intentional harm inflicted on one person by another. Any crime involving a physical attack (or the threat of an attack) is usually classified as an assault, a battery, or both.[19] Forcing care on a person against their wishes can be grounds for assault or even battery. Don't touch or give first aid to a conscious person who refuses it.

Abandonment

To be abandoned is to be left without needed protection, care, or support. Although there is generally no duty to rescue for a first aid and/or CPR AED provider, once you decide to help, you should not abandon the victim. Stay with them and continue to care for them until someone with equivalent or higher training takes over for you.

18 Sec. 12112. Discrimination. Available: https://www.ada.gov/pubs/adastatute08mark.htm [Retrieved 5/20/21]

19 Bergman, P. Assault, Battery, and Aggravated Assault. Available: https://www.nolo.com/legal-encyclopedia/assault-battery-aggravated-assault-33775.html [Retrieved 11/29/21]

FIRST AID PROVIDER: ROLES, RESPONSIBILITIES, & PRIORITIES

A trained first aid provider must be able to recognize, assess, and prioritize the need for first aid. Doing so requires being able to recognize life-threatening conditions. There are situations where time is of the essence, and delays can lead to serious, even fatal consequences. Life-threatening conditions include unresponsiveness, severe external bleeding, shock, altered mental status, difficulty or no breathing, choking, stroke, and chest pain or discomfort. Other warning signs and symptoms of a life-threatening condition include coughing or vomiting blood, persistent vomiting, head injury, seizures, poisoning, severe allergic reaction, or major broken bones.[20]

A trained first aid provider must provide care using appropriate skill competencies. Skill competency in first aid is the ability to use first aid knowledge and skills confidently and effectively. Learning, practicing, and using step-by-step procedures for handling life-threatening conditions will help you develop competency in first aid.

Recognizing your limitations means acknowledging the limits of what you know and what you can do. Failing to recognize your limitations has the potential to cause harm. A first aid provider should never go beyond the knowledge and skill competence they have learned and demonstrated in training. Know your limits and seek additional professional help when needed.

20 Emergency Care vs. Urgent Care: What's the Difference? The American College of Emergency Physicians. https://www.emergencyphysicians.org/article/er101/emergency-care-vs.-urgent-care-whats-the-difference [Retrieved 5/19/21]

ASSESSMENT

Assessment of the scene and the person is a critical skill that applies in any emergency. The steps of assessment are crucial in all but the most minor circumstances. The steps of assessment are always the same. The steps of assessment list the actions in sequence, but in a real emergency they may need to be carried out in a different order or performed simultaneously when multiple providers are available.

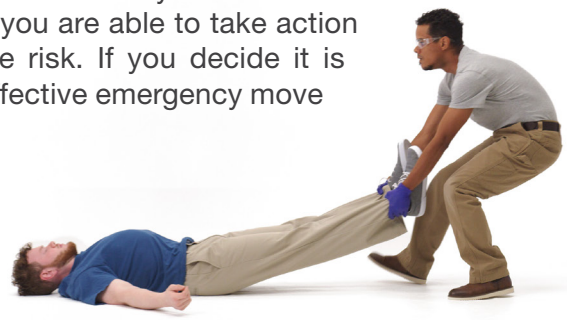
1. Assess scene safety.
2. Take Standard Precautions.
3. Assess responsiveness.
4. Activate EMS and/or your emergency action plan (EAP).
5. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED.
6. Assess breathing for no more than 10 seconds.

Assess Scene Safety

Emergency scenes can be dangerous. Your personal safety is the highest priority, even before the safety of an ill or injured person. Always pause for a moment before approaching. Look for obvious hazards and consider the possibility of hidden dangers. Hidden dangers include environmental hazards such as toxic or corrosive chemicals (like hydrochloric and sulfuric acid) that can attack and destroy exposed body tissues, and gases or vapors (asphyxiants) that can cause unconsciousness and death by suffocation (such as nitrogen, propane, and carbon dioxide).

Emergency Moves

It is best not to move an ill or injured person at all, especially when you suspect a spinal or pelvic injury. You should only move a victim when there is an immediate danger, and you are able to take action without placing yourself at unreasonable risk. If you decide it is necessary to move someone, the most effective emergency move is a drag.



When using a drag, pull in the direction of the long axis of the body to keep the spine in line. Never pull on a person's head or pull a person's body sideways. Use your legs, not your back, and keep the person's weight as close to your body as possible. Avoid twisting. Consider if you can safely move the person based on your physical ability to avoid hurting yourself.

Common drags include the following:

- Extremity drag: Performed by grasping and pulling on the ankles or forearms.
- Clothing drag: Performed by pulling on a person's shirt in the neck and shoulder area.
- Blanket drag: Performed by rolling a person onto a blanket and dragging the blanket.

Confined spaces are especially dangerous.[21] Although they are not necessarily designed for people, a confined space is often large enough for workers to enter to perform certain jobs. A confined space also has limited or restricted means for entry or exit and is not designed for continuous occupancy. Confined spaces include, but are not limited to: tanks, vessels, silos, storage bins, hoppers, vaults, pits, manholes, tunnels, equipment housings, ductwork, pipelines, etc.

Many workers are injured and killed each year while working in confined spaces. An estimated 60% of the fatalities have been among "would-be rescuers." Specialized training and equipment are necessary to rescue someone from a confined space including atmospheric monitors, fall protection, extraction equipment, and self-contained breathing apparatus (SCBA). Never enter tanks or other confined spaces to perform a rescue without proper training and equipment. If the scene is unsafe, do not approach it. Activate EMS and/or your EAP.

21 Safety and Health Topics, Confined Spaces. Occupational Safety & Health Administration. Available: https://www.osha.gov/confined-spaces/hazards-solutions [Retrieved 12/1/21]

Wash Your Hands

Wash your hands immediately after removing gloves. Follow these five steps every time.

1. Wet your hands with clean, running water (warm or cold), turn off the tap, and apply soap.
2. Lather your hands by rubbing them together with the soap.
3. Scrub your hands for at least 20 seconds.
4. Rinse your hands well under clean, running water.
5. Dry your hands using a clean towel or air dry them.[22]

> ***If*** *soap and water are not readily available, use an alcohol-based hand sanitizer that contains at least 60% alcohol, and wash with soap and water as soon as you can.*

22 "How and When to Wash Your Hands." *Centers for Disease Control and Prevention*. https://www.cdc.gov/handwashing/when-how-handwashing.html [Retrieved 5/21/21]

Take Standard Precautions

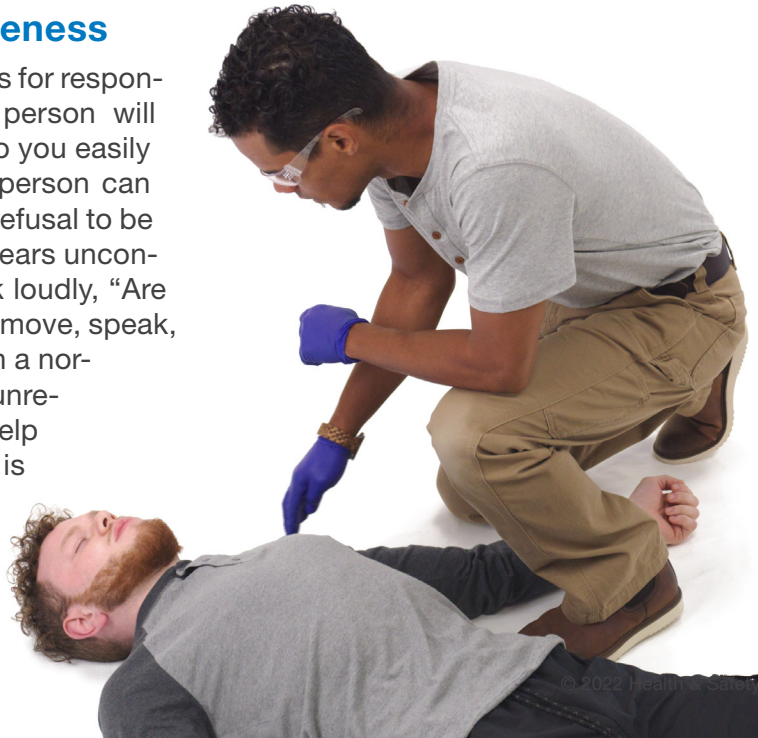
In this program, "take Standard Precautions" means "use appropriate personal protective equipment (PPE). PPE is equipment worn in the workplace to minimize exposure to hazards that cause serious injuries and illnesses, such as blood or airborne organisms that can cause disease. Depending on your role as a first aid provider, appropriate PPE may include gloves, goggles or face shields, surgical masks, gowns, respirators, and CPR masks.

Practicing putting on and taking off PPE, also called donning and doffing, is critical for your safety and to minimize potential delays in emergency treatment. If you are a designated first aid provider in your workplace, training and practice in donning and doffing PPE according to the program established by your employer is required by state and federal occupational safety and health regulations.

At a bare minimum, you should wear gloves and eye protection while giving first aid. They will help prevent exposure to potentially infectious body fluids, such as blood, saliva, and vomit. Due to the risk of infection, the proper removal of contaminated gloves is imperative.

Assess Responsiveness

If the scene is safe, assess for responsiveness. A responsive person will give an answer or react to you easily or readily. A responsive person can express their consent or refusal to be helped. If the person appears unconscious, tap them and ask loudly, "Are you okay?" If they do not move, speak, blink or otherwise react in a normal way, consider them unresponsive. Consent to help is implied when a person is unresponsive.



Activate EMS &/or Emergency Action Plan (EAP)

If the person is unresponsive, or if you recognize the signs and symptoms of a life-threatening condition in a responsive person (or are just unsure), call 911 to activate EMS using a mobile device or activate your occupational emergency action plan (EAP).

EMS dispatchers, also called telecommunicators, have the responsibility to prioritize emergency calls using the information provided by the caller. They notify and dispatch the appropriate responders and offer first aid instructions to callers. When you activate EMS, listen to and follow the dispatcher's instructions. Answer questions as clearly and concisely as you can. Turn on the speaker function of your mobile phone so you can listen to the dispatcher and follow their directions to provide first aid at the same time.

An emergency action plan (EAP) is a written document required by Occupational Safety and Health Administration standards. The purpose of an EAP is to facilitate and organize employer and employee actions during workplace emergencies. Emergency action plans take into account the specific layout, size, and features of a particular worksite.

As a trained first aid provider, you must know how to activate your EAP at work. It might be just calling 911 or you may have to use an internal telephone number, intercom, public address system, or a specialized emergency notification system. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED.

Send Someone to Get the First Aid Kit & an AED

The first aid kit should meet or exceed the minimum requirements for workplace first aid kits and supplies.[23] Both the first aid kit and AED should be able to be obtained quickly and easily from a well-marked, designated location. If you find yourself in the midst of a medical emergency alone, or with no or limited first aid equipment, call 911 to activate EMS using a mobile device or activate your EAP. Listen to and follow the dispatcher's instructions.

23 American National Standard. Minimum Requirements for Workplace First Aid Kits and Supplies. ANSI/ISEA Z308.1-2015. Available: https://blog.ansi.org/2018/06/workplace-first-aid-kits-ansi-isea-z308-2015/ [Retrieved 11/29/21]

Conventional CPR & Compression-Only CPR

Trained CPR providers who are able should perform conventional CPR. Conventional CPR combines chest compressions with artificial ventilation to circulate oxygenated blood to the brain and heart. Artificial ventilation is also known as rescue breaths, which are provided by blowing exhaled air through a CPR mask.

Individuals not formally trained in CPR should perform compression-only CPR. Compression-only CPR is a simplified form of adult CPR for the untrained bystander: chest compressions *without* artificial ventilation. Deliver compression-only CPR by pushing hard and fast on the center of the chest. Compression-only CPR isn't appropriate or recommended for children. However, if you are unwilling or unable to deliver breaths, perform compression-only CPR, as it is preferable to no CPR.

Assess Breathing for No More than 10 Seconds

Look at the chest and face for signs of normal breathing. Normal breathing is effortless, quiet, and regular. Then, take action based the person's responsiveness and breathing.

If the person appears responsive, obtain consent. Introduce yourself and ask, "May I help you?"

If the person is unresponsive and breathing normally, maintain an open airway.

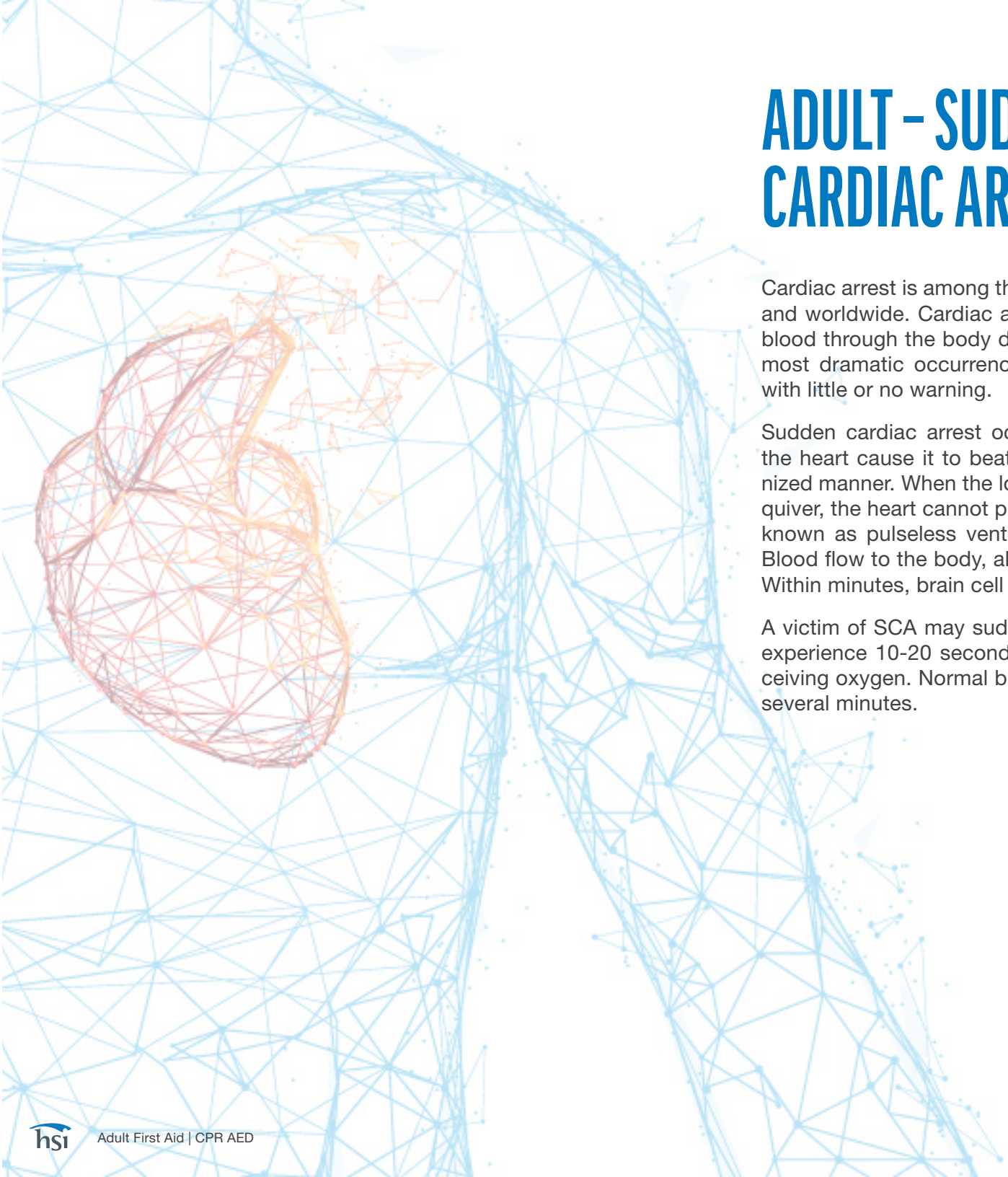
The airway is the passage by which air reaches a person's lungs. When an unresponsive person is lying flat on their back, decreased muscle tone and the pull of gravity causes the base of the tongue to obstruct the upper airway. Without an open airway, the person cannot breathe. Their heart will stop within minutes.

The "recovery position" uses gravity to keep the tongue from blocking the airway and to allow fluids to drain from the mouth. Place an uninjured, breathing, unresponsive person on their side in the recovery position to help protect the airway.

If an unresponsive person is not breathing normally or only gasping, immediately start CPR, beginning with chest compressions.

section one

ADULT CPR AED



ADULT – SUDDEN CARDIAC ARREST (SCA)

Cardiac arrest is among the leading causes of death in the United States and worldwide. Cardiac arrest is the loss of the heart's ability to pump blood through the body due to an inadequate or absent heartbeat. The most dramatic occurrence, sudden cardiac arrest (SCA), can happen with little or no warning.

Sudden cardiac arrest occurs when the normal electrical impulses in the heart cause it to beat too quickly, inefficiently, or in an unsynchronized manner. When the lower chambers of the heart beat too quickly or quiver, the heart cannot pump blood. These abnormal heart rhythms are known as pulseless ventricular tachycardia and ventricular fibrillation. Blood flow to the body, along with the oxygen it carries, abruptly stops. Within minutes, brain cell death starts to occur from the lack of oxygen.

A victim of SCA may suddenly collapse. Occasionally, SCA victims will experience 10-20 seconds of seizure activity when the brain stops receiving oxygen. Normal breathing stops. Abnormal gasping may last for several minutes.

CPR and Defibrillation

CPR is the immediate treatment for suspected SCA. CPR can restore limited oxygen to the brain and other vital organs through a combination of chest compressions, an open airway, and rescue breaths. However, CPR alone is not enough.

The most effective way to end pulseless ventricular tachycardia and ventricular fibrillation is defibrillation, using an automated external defibrillator (AED) with electrode pads adhered to the chest. An electrical shock passed through the chest may restore the heart's normal contractions.

Immediate, high-quality CPR and early defibrillation with an AED can more than double the likelihood for survival. These two elements are parts of the adult "chain of survival," a series of six interdependent links that describe the best approach to cardiac arrest care.

Safety & Health Tip

Following a heart-healthy lifestyle can help you lower your risk for heart disease, SCA, and other heart problems. A heart-healthy lifestyle includes eating a heart-healthy diet, aiming for a healthy weight, managing stress, engaging in physical activity, and quitting smoking.[24]

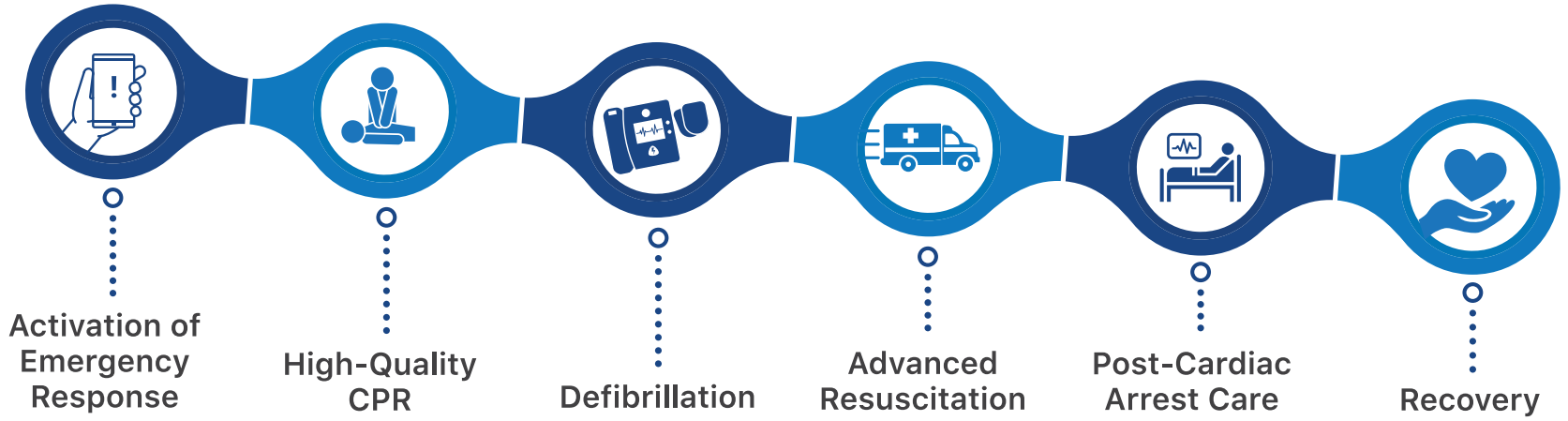
Adult Chain of Survival

Each link in the chain is essential for the most positive outcome. If a single link is missing, the chances for survival are greatly reduced. The adult chain of survival consists of:

- Early recognition of cardiac arrest and prompt activation of EMS,
- Immediate high-quality CPR beginning with chest compressions,
- Early defibrillation with an AED (when indicated),
- Effective advanced life support treatment,
- Effective post-cardiac arrest care at a hospital, and
- Recovery.

The greatest chance for survival exists when all the links of the chain of survival are strong.

Early recognition of SCA and activation of EMS and/or an EAP gets help coming right away. Immediate high-quality CPR improves the victim's chance of survival by providing oxygen to the heart and brain. Attaching an AED as soon as it becomes available speeds up time to defibrillation, if indicated. Effective advanced life support treatment, with a focus on return of spontaneous circulation (ROSC) and transport to a hospital for all persons with a chance of survival supports the most favorable outcome. Effective post-cardiac care, including monitoring and the use of medication, helps prevent the return of cardiac arrest and improves the likelihood of long-term survival. Recovery supports the person's physical and emotional needs that are ongoing after hospital discharge.



24 The National Heart, Lung, and Blood Institute. Sudden Cardiac Arrest. Available: https://www.nhlbi.nih.gov/health-topics/sudden-cardiac-arrest [Retrieved 8/13/21]

ADULT – ASSESSMENT & CHEST COMPRESSIONS

Assessment of the scene and the person is a critical skill that applies in any emergency. The steps of assessment are crucial in determining the provider's next actions.

As a single CPR provider, follow the CPR AED procedure:

Assess Scene Safety

- First assess scene safety. Before anything else, pause to make sure the scene is safe for you and the victim.
- If the scene is not safe, do not enter it until hazards have been minimized or eliminated. This includes taking Standard Precautions.

Assess Responsiveness

- If the scene is safe, assess responsiveness. Tap the person and ask loudly, "Are you okay?"

Activate EMS and/or EAP

- If the person is unresponsive, call 911 to activate EMS using a mobile device and/or activate your EAP.

Send Someone to Get the First Aid Kit and an AED

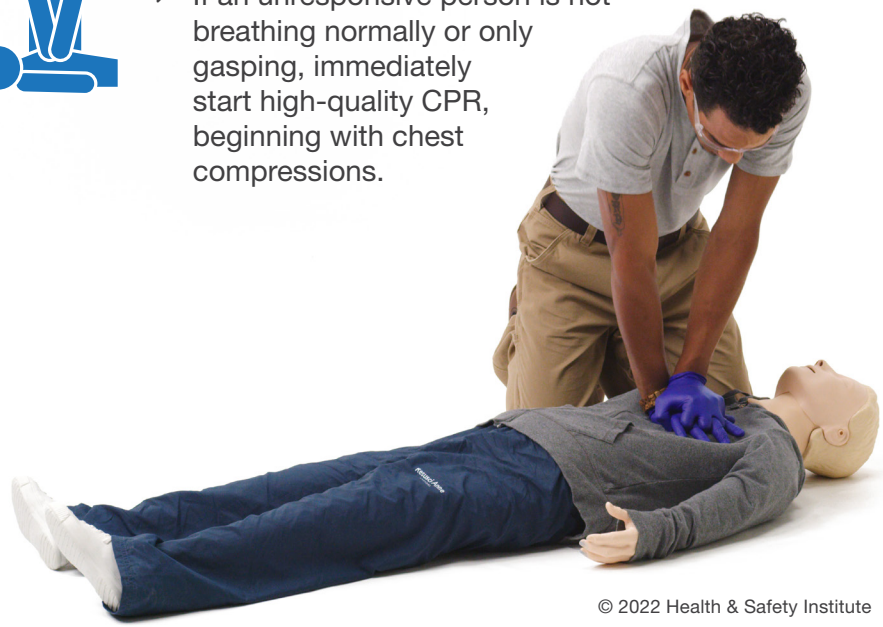
  - After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED.

Assess Breathing

- Assess the person's breathing for no more than 10 seconds. Look at the person's chest and face for signs of normal breathing.
  - Normal breathing is effortless, quiet, and regular. Look for the chest to rise and fall.
  - Weak, irregular gasping, snorting, snoring, or gurgling sounds are known as agonal breaths. This is not normal breathing. It is a sign of cardiac arrest.

Unresponsive, Not Breathing Normally

- If an unresponsive person is not breathing normally or only gasping, immediately start high-quality CPR, beginning with chest compressions.



Adult Chest Compressions

High-quality CPR is the primary influence on survival from cardiac arrest. High-quality chest compressions are the foundation of high-quality CPR. External compression of the chest increases pressure inside the chest and directly compresses the heart, forcing blood to move from the chest to the lungs, heart, brain, and the rest of the body. When chest compressions stop, blood flow decreases significantly. When compressions start again, it takes several compressions to restore blood flow. The more times chest compressions are interrupted and the longer the interruption, the less the blood flow to the brain, heart, and other organs. Minimal interruption improves blood flow.

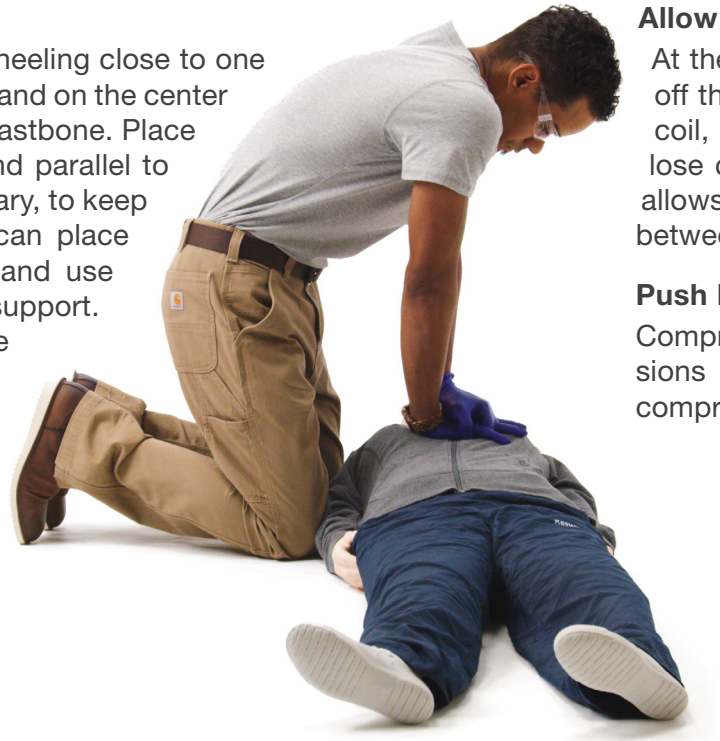
CPR should be performed where the victim is found if it is safe to do so.

CPR Provider Position

Position yourself at the person's side, kneeling close to one side of the chest. Place the heel of one hand on the center of the chest, on the lower half of the breastbone. Place the heel of the other hand on top of and parallel to the first. Interlock your fingers, if necessary, to keep them off the chest. Alternatively, you can place one hand on the center of the chest and use your other hand to grasp your wrist for support. Position your shoulders directly above your hands and straighten your arms to lock your elbows.

Push Hard and Deep

Push hard and deep, straight down, using your upper body weight to compress the chest at least 2 inches (5 centimeters).



Allow Complete Chest Recoil

At the end of each compression, lift all your weight off the person's chest, allowing it to completely recoil, or rebound, to its normal position, but do not lose contact with the chest. Complete chest recoil allows the heart to refill. Avoid leaning on the chest between compressions.

Push Fast

Compress the chest at a rate of 100-120 compressions per minute. Perform 30 high-quality chest compressions. Count out loud.

Use a CPR Feedback Device

A CPR feedback device transmits information on compression rate, depth, and recoil. Providers can significantly improve chest compression quality by adjusting technique based on data from a feedback device. Using a CPR feedback device is shown to improve outcomes and is recommended during CPR training and in real life resuscitation attempts.

ADULT – RESCUE BREATHING & USING A CPR MASK

Rescue breathing is artificial ventilation of the lungs. It provides oxygenation of the blood and removal of carbon dioxide. It is an important component for successful resuscitation. Conventional CPR with rescue breathing should be performed by all trained CPR providers who are willing and able.

To give rescue breaths, there must be an open airway. The airway is the only path for getting air into the lungs. The tongue is connected to the lower jaw. Lifting the jaw forward pulls the tongue away from the back of the throat, relieving the obstruction and opening the airway.

Head Tilt–Chin Lift

To open the airway with the head tilt–chin lift maneuver, position yourself at the person's side. Place one hand on their forehead. Place the fingertips of your other hand under the bony part of the lower jaw, near the chin. Apply firm, backward pressure on the forehead while lifting the chin upward. Avoid pressing into the soft tissue of the chin with your fingers, as this can also obstruct the airway. Leave the mouth slightly open.

Rescue Breathing

CPR providers can give rescue breathing using their own exhaled breath and a CPR mask. Room air contains about 21% oxygen. Exhaled air contains between 16% and 17% oxygen. This exhaled oxygen is enough to support life. Some CPR masks allow you to attach a high-efficiency particulate air (HEPA) filter to provide further protection during CPR. The HEPA filter fits between the valve and mask, in the path of the exhaled air. HEPA filters can trap airborne virus particles.

Using a CPR Mask

To use a CPR mask, position yourself at the person's side. Place the mask flat on the person's face with the top of the mask over the bridge of the nose. Use your thumb and forefinger to provide uniform pressure around the top of the mask. Use the thumb of your other hand lifting the chin to control the bottom of the mask. Hook your fingertips of the hand controlling the bottom of the mask under the bony ridge of the jaw. Open the airway with the head tilt–chin lift maneuver.

Tilt the head and lift the chin to open the airway. Lift the person's face up into the mask to create an airtight seal. Give a rescue breath by blowing through the valve opening. Each breath is 1 second in length. **Give enough air to create a visible rise of the chest, but no more. Stop your rescue breath as soon as you see chest rise.** Remove your mouth and let the person exhale.

Importance of Adult Rescue Breaths, Secondary Cardiac Arrest

Rescue breaths are critically important in CPR, as they provide life-sustaining oxygen and ventilation directly to the person's lungs. In addition to caring for SCA persons, CPR providers may provide care for victims of secondary cardiac arrest. Secondary cardiac arrest is different from sudden cardiac arrest because it results from a problem originating outside the heart. For example, when the person stops breathing from a drug or alcohol overdose.

Too Many Breaths or a Large Volume Can Be Harmful.

CPR providers should avoid giving too many breaths or a large volume during rescue breathing because it can be harmful. It can force air into the stomach, causing regurgitation of food, liquids, or vomit into the airway. Give enough air to make the chest rise, but no more than that. Stop your rescue breath as soon as you see chest rise.

Drowning

The immediate cause of death in drowning is a lack of oxygen. As a result, the first and most important treatment is giving rescue breaths to a drowning victim. In the case of drowning, begin with rescue breaths. As soon as the unresponsive victim is removed from the water, open the airway and assess breathing. If there is no breathing, give 2 rescue breaths that make the chest rise (if this was not done previously in the water).[25]

Safety & Health Tip

Alcohol is the leading known contributing factor in fatal boating accidents. Where the cause of death was known, 75 percent of fatal boating accident victims drowned, and 86 percent were not wearing a life jacket. Wear a life jacket. Boat sober.[26]

25 Part 12:11 Cardiac Arrest in Special Situations. Drowning. Vanden Hoek TL, et al. 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation. 2010 Nov 2;122(18 Suppl 3):S829-61. doi: 10.1161/CIRCULATIONAHA.110.971069. Erratum in: Circulation. 2011 Feb 15;123(6):e239. Erratum in: Circulation. 2011 Oct 11;124(15):e405. PMID: 20956228. [Retrieved 11/30/21]

26 U.S. Coast Guard releases 2020 Boating Safety Statistics Report. Maritime Commons. Available: https://mariners.coastguard.blog/2021/06/30/u-s-coast-guard-releases-2020-boating-safety-statistics-report/ [Retrieved 9/13/21]

ADULT – AUTOMATED EXTERNAL DEFIBRILLATION & USING AN AED

An automated external defibrillator (AED) is a portable computerized device that is simple to operate. It can identify pulseless ventricular tachycardia and ventricular fibrillation and deliver an electrical shock to restore the heart's normal contractions. If the electrical shock is effective, there will be a return of spontaneous circulation. The heart will be able to pump blood. The person may also start breathing, moving, or reacting in other ways.

AED Operation

AED design varies by model and manufacturer, but they all operate in a similar manner. If you have an AED in your workplace, be familiar with its operation.

Power on the AED

- Opening the lid will turn on the power for some AEDs. With others, simply press the power button. This starts voice prompts and readies the device for use.

Bare the Chest

- Proper AED operation requires direct contact between the pads and the person's skin. Any clothing in the way must be removed. This includes swimsuits, bras, and any other clothing covering a person's chest. If necessary, cut through clothing with the shears that are typically included with a CPR AED response kit.

Apply the AED Pads

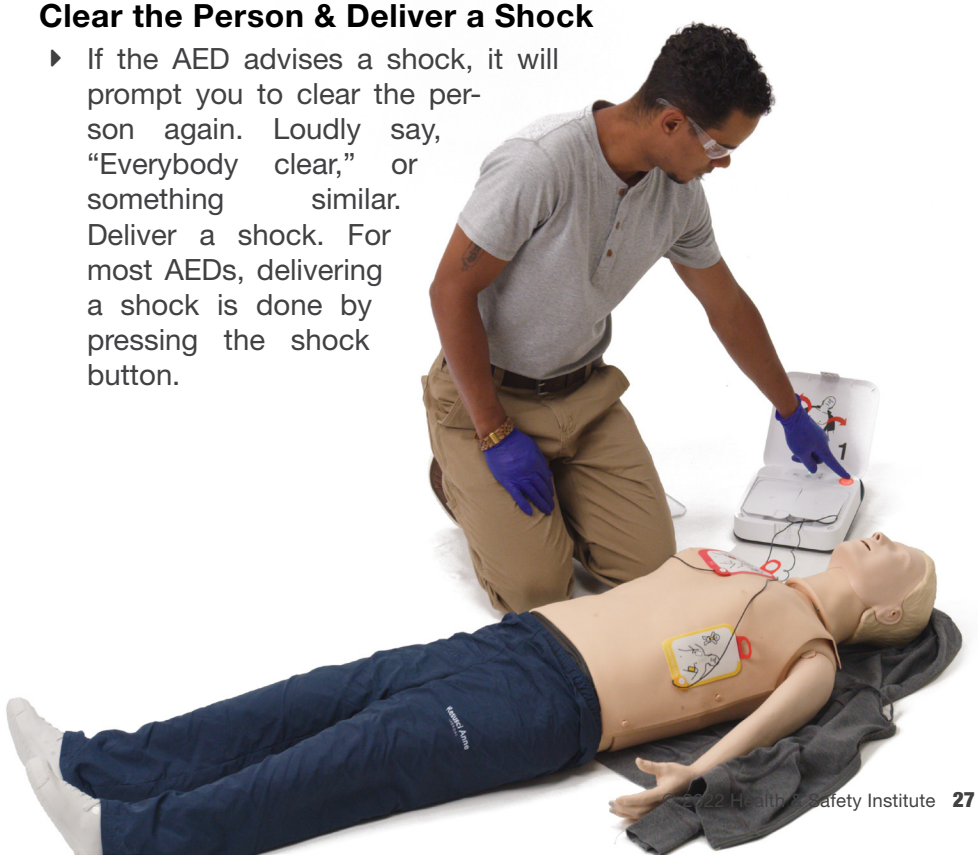
- Use adult AED pads for persons 8 years of age or older. Locate and pull out the defibrillation pads. The pads have pictures on them to show proper placement. Peel the pads from the backing sheet one at a time and place each according to the pictures. Press the pads firmly in place. Pads must not touch or overlap each other. Avoid placing the pads over medication patches or implanted devices. Try to apply the pads within 30 seconds after the AED arrives.

Allow AED Analysis

- When the AED voice prompts you, clear the person and allow the AED to analyze the heart rhythm. Be certain that no one is touching the person.

Clear the Person & Deliver a Shock

- If the AED advises a shock, it will prompt you to clear the person again. Loudly say, "Everybody clear," or something similar. Deliver a shock. For most AEDs, delivering a shock is done by pressing the shock button.



Resume CPR & Follow AED Voice Prompts

- Once a shock has been delivered, immediately resume CPR starting with chest compressions. After about 2 minutes of CPR, the AED will prompt you again to analyze the heart rhythm. Follow the voice prompts.

Continue CPR AED

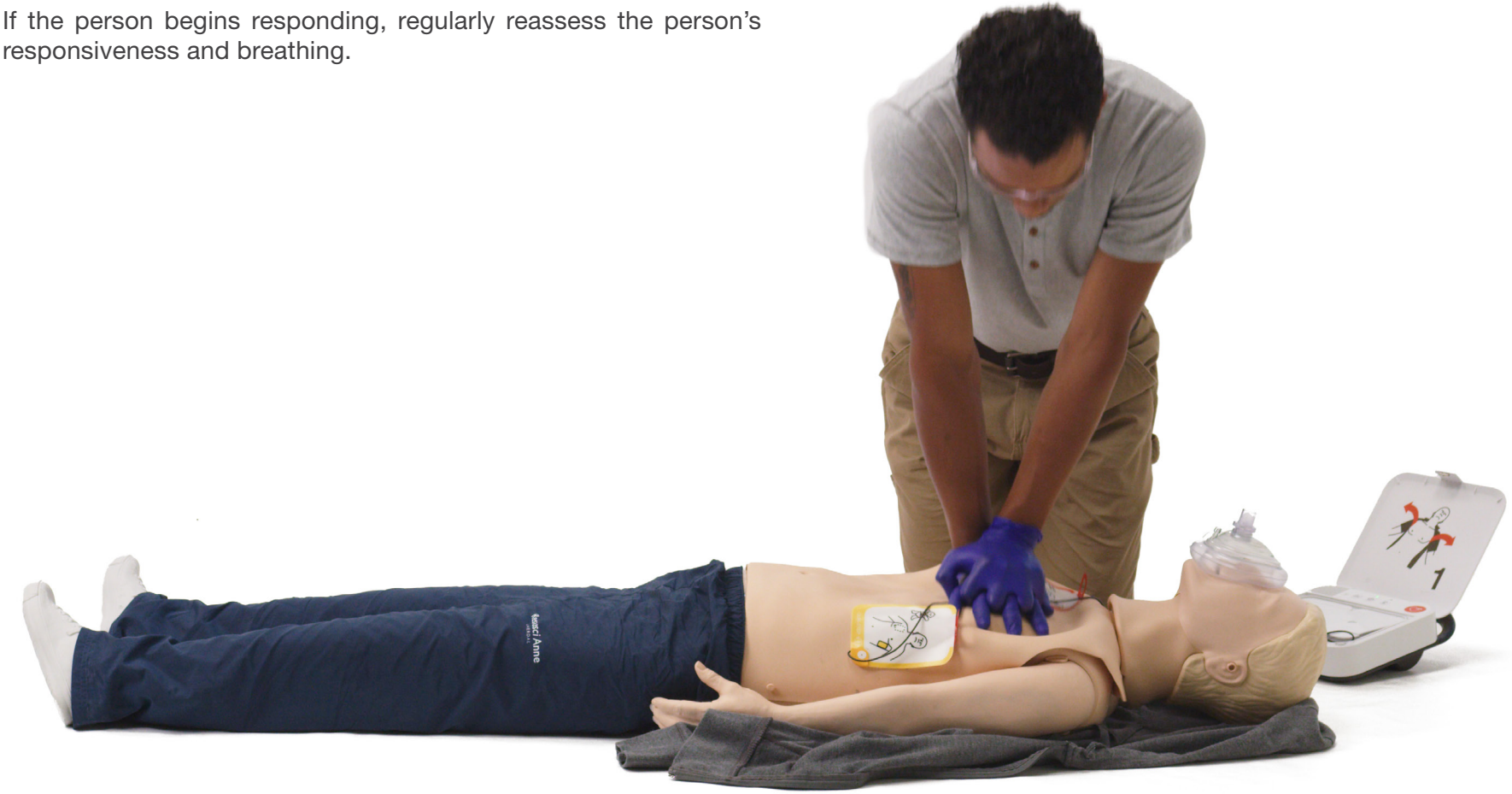
- Continue CPR AED until another CPR provider, someone with more advanced training, or EMS providers arrive and take over, or until the person starts breathing, moving, or reacting in other ways.

Reassess Regularly

If the person begins responding, regularly reassess the person's responsiveness and breathing.

Safety & Health Tip

The United States Food and Drug Administration (FDA) encourages individuals and organizations to ensure their AED is FDA-approved (and if it is not, to make plans to transition to an FDA-approved AED). The FDA maintains a list of FDA-approved AEDs. Search for "automated external defibrillators" at fda.gov.



ADULT – ONE-PROVIDER CPR AED

If an unresponsive person is not breathing normally or only gasping, one CPR provider can provide high-quality adult CPR by putting together all the skills of assessment, compressions, airway, breathing, and AED use.

Perform an Assessment

- First, assess scene safety, taking Standard Precautions. If the scene is safe, assess the person's responsiveness. Tap the person and ask loudly, "Are you okay?"
- If the person is unresponsive, activate EMS and/or your EAP.
- After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED.
- Assess the person's breathing for no more than 10 seconds. If the person is not breathing normally or only gasping, start high-quality CPR.

Perform High-Quality Chest Compressions

- Position the person on a firm, flat surface. Perform 30 high-quality chest compressions. Position two hands on the lower half of the breastbone. Use upper body weight to compress. Compress at least 2 inches (5 centimeters). Compress at a rate of 100–120 times per minute. Allow the chest to fully recoil at the top of each compression.

Give Rescue Breaths

- Use a CPR mask to give rescue breaths. Open the airway and give 2 rescue breaths. Ensure each breath is 1 second in length and creates visible rise of the chest.

Continue CPR

- Immediately resume high-quality chest compressions.
- Repeat CPR cycles of 30 compressions and 2 breaths for 2 minutes.

Operate the AED

- As soon as an AED is available, power on the AED. Bare the chest.
- Correctly apply the AED pads according to the pictures.
- Clear the person so the AED can analyze the heart rhythm. While the AED is analyzing, make sure no one is touching the person.
- If directed by the AED to deliver a shock, clear the person again and press the shock button.

Resume High-Quality CPR

- Immediately resume high-quality CPR starting with chest compressions.
- Follow the voice prompts. After about 2 minutes of CPR, the AED will prompt you again to analyze the heart rhythm. Follow the voice prompts.

Continue CPR AED

- Continue CPR AED until another CPR provider, someone with more advanced training, or EMS providers arrive and take over, or until the person starts breathing, moving, or reacting in other ways.
- If another CPR provider is available, takes turns providing chest compressions. Switch providers about every 2 minutes, or sooner if they get tired. Try to minimize interruptions to compressions to less than 10 seconds.

Safety & Health Tip

If you find yourself unexpectedly encountering a person in cardiac arrest, you have limited or no PPE, and you are unwilling to provide rescue breathing out of fear the person may have an infectious disease, you can still help the person by providing compression-only CPR.

ADULT – ADDITIONAL CPR AED CONSIDERATIONS

A CPR provider may face some circumstances that require additional considerations or tasks for effective care. Act quickly if anything affects AED use to keep this link in the chain strong.

Chest Hair

Thick chest hair may prevent the AED pads from adhering to the skin. If chest hair is preventing pad-to-skin contact, use the razor that is typically included with a CPR AED response kit to quickly shave the spots where the pads will be placed. If you do not have a razor, but a second pair of pads is available, use the first set of pads to remove the hair from the skin. Apply the first set of pads firmly over the chest hair, then pull the pads off quickly. Then apply the second set of pads.

In Water

Do not use an AED if the person is immersed in water. The person must be removed from water before using an AED.

Wet Setting

If the person is in a wet setting, such as lying on snow or ice, in rain, on a wet floor or deck, or in a small puddle, it is safe to use the AED. If the person's chest is wet, quickly dry the chest before applying pads.

On Metal

AEDs can be used safely on metal surfaces, such as gratings or stairwells. Make sure the pads do not directly touch any metal surface when the AED is powered on.

Implanted Devices

Persons at high risk for cardiac arrest may have a surgically implanted defibrillator or pacemaker. Most often, a noticeable lump is visible in the left upper chest, though sometimes the implant is in the upper right chest or abdomen. Avoid placing the AED pad directly over the implant, as the device may interfere with shock delivery.

Medication Patches

Do not place AED electrode pads directly on top of a medication patch. A patch could block delivery of the shock from the electrode pad to the heart and cause small burns to the skin. If it doesn't delay shock delivery, peel off the patch with a gloved hand and quickly wipe the area before attaching the electrode pad.

Metal Jewelry

If the AED pads are not in contact with metal jewelry, the jewelry does not have to be removed.

Pregnant Person in Cardiac Arrest

Do not delay chest compressions or defibrillation for a pregnant person. Follow the normal steps for operating the AED. The shock from the AED will not harm the baby. If the person starts breathing, moving, or reacting in other ways, place the person on their left side to improve blood flow.

Take Standard Precautions

Resuscitation efforts put CPR providers at an increased risk of occupational exposure and infection from bloodborne and airborne pathogens. CPR providers should routinely take Standard Precautions during resuscitation, including using a CPR mask with a HEPA filter when available.

Mouth-to-Mouth Rescue Breathing

There may be a rare or extraordinary circumstance when a barrier device is not available and a CPR provider is willing to provide mouth-to-mouth rescue breathing. Mouth-to-mouth rescue breathing is a form of artificial ventilation that can provide oxygen to a respiratory or cardiac arrest victim.

To give mouth-to-mouth rescue breathing to an adult, open the airway with a head tilt–chin lift. Pinch the nose closed with your thumb and forefinger. Take a regular-sized breath and seal your lips around the person's mouth, creating an airtight seal. Give 1 breath over 1 second. Give enough air to make the chest visibly rise, but no more than that.

ADULT – SUSPECTED OPIOID-ASSOCIATED EMERGENCY (OAE)

Drug overdose deaths continue to increase in the United States. Seventy percent of drug overdose deaths involve a prescription or illicit opioid such as oxycodone, hydrocodone, morphine, fentanyl, or heroin. Opioids can cause death by slowing, and eventually stopping, breathing. Recognizing an opioid overdose can be difficult. Signs of an overdose may include:

- Small, constricted "pinpoint pupils,"
- Changes in skin appearance and condition,
- Falling asleep or loss of consciousness,
- Slow, shallow breathing,
- Choking or gurgling sounds, and
- Limp body.

A quick response to an opioid overdose, including administering naloxone, can prevent brain injury and death. Naloxone is a medication approved by the U.S. Food and Drug Administration (FDA) designed to rapidly reverse opioid overdose. Naloxone is available without a prescription in all U.S. states, the District of Columbia, and Puerto Rico.

Using Narcan® Nasal Spray[27]

Narcan® Nasal Spray is the most prescribed opioid reversal medication. To use Narcan® Nasal Spray, peel back the package to remove the device. Hold the device with your thumb on the bottom of the plunger and 2 fingers on the nozzle. Place and hold the tip of the nozzle in either nostril until your fingers touch the bottom of the person's nose. Press the plunger firmly to release the dose into the nose.

27 Key steps to administering Narcan® nasal spray. Available: https://www.narcan.com/patients/how-to-use-narcan/ [Retrieved 6/22/21]

Procedure for Suspected OAE

If you suspect an opioid-associated emergency, assess scene safety. Take Standard Precautions. Avoid contact with drug residue, containers, needles, and other paraphernalia. Assess responsiveness. Tap the victim and ask loudly, “Are you okay?” If the person is unresponsive, activate EMS and/or your EAP.

After activating, and unless they are readily available to you, send someone to get the first aid kit, naloxone, and an AED. Assess the person’s breathing for no more than 10 seconds. If the unresponsive person is not breathing normally or only gasping, immediately start CPR, beginning with chest compressions. Use the AED as soon as one becomes available. Give naloxone as soon as you can, but do not delay CPR AED to give it.

If an unresponsive person is breathing normally, give naloxone if available. To help protect the airway, place the person in the recovery position. Regularly reassess scene safety, responsiveness, and breathing. Stay with the person until someone with more advanced training or EMS arrives and takes over.

If the person does not respond, another naloxone dose may be given in the same way. Narcan® Nasal Spray may be dosed every 2 to 3 minutes, if available.

Safety & Health Tip

The U.S. Department of Health and Human Services (HHS) Substance Abuse and Mental Health Services Administration (SAMHSA) National Helpline, 1-800-662-HELP (4357), is a confidential, free, 24-hours-a-day/365-days-a-year information service. Available in English and Spanish, this helpline is for individuals and family members facing mental and/or substance use disorders. This service provides referrals to local treatment facilities, support groups, and community-based organizations.

ADULT – RELIEF OF CHOKING

Choking, also known as foreign-body airway obstruction, can occur when a solid object, such as a piece of food or a small object, becomes stuck in the upper airway. The person cannot breathe. A forceful thrust beneath the ribs and up into the diaphragm can pressurize the air in the chest and pop out the obstruction. Chest compressions can also create enough pressure to expel a foreign-body airway obstruction.

Mild Airway Obstruction

To provide the appropriate care, you must be able to recognize the difference between a mild and a severe airway obstruction. With a mild obstruction, the person can speak and cough. They may wheeze between coughs. A mild obstruction is typically cleared naturally by the person through forceful coughing. If the person can inhale and exhale, encourage the person to continue coughing. Watch for signs of the airway obstruction becoming severe.

Severe Airway Obstruction

When a severe airway obstruction occurs, the person cannot get air in or out of the lungs. This is a life-threatening medical emergency. If the foreign body is not removed, the person will quickly become unresponsive and suffer a secondary cardiac arrest within minutes.

Responsive Person

Signs of a severe airway obstruction include the inability to speak, a weak cough, or no cough at all. The person may make a high-pitched noise when trying to inhale or make no sound at all. They may hold their hands to the throat. Ask, “Are you choking?” If the person nods yes, or is unable to speak or cough, act quickly. If you are not alone, have someone call 911 to activate EMS using a mobile device and/or activate your EAP.

Position Yourself

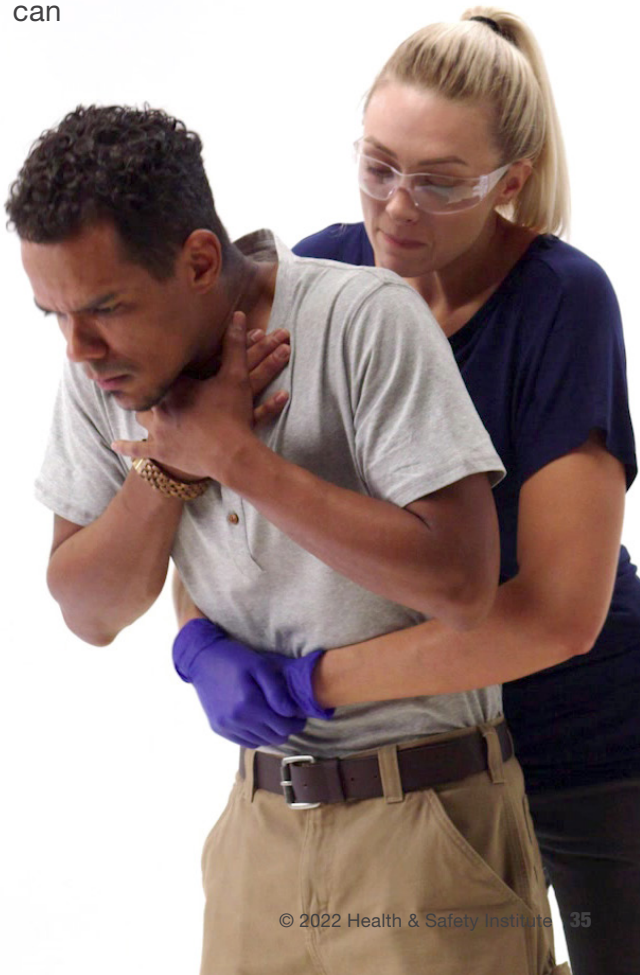
Stand behind the person. Reach around and locate the navel. Make a fist with the other hand and place it thumb-side against the abdomen, just above the navel and below the ribs. Grasp your fist with the other hand.

Give Thrusts

Quickly thrust inward and upward into the abdomen. Repeat. Each thrust needs to be given with the intent of dislodging and expelling the object.

Continue until the person can breathe normally or becomes unresponsive.

If the object is expelled and there is a good air exchange, encourage the person to be seen by a healthcare professional. Infrequent, but serious complications from abdominal thrusts can occur.



Pregnant or Large Adult

If the person is pregnant or very large and you cannot wrap your arms around them, use chest thrusts instead of abdominal thrusts.

- Position yourself directly behind the person. Reach under the armpits and place the thumb-side of your fist on the center of the chest. Grasp your fist with your other hand and thrust straight backward. Try to not put pressure on the ribs.
- Give each chest thrust forcefully with the intent of dislodging and expelling the object. Repeat the chest thrusts until the object is expelled and the person can breathe or becomes unresponsive.

If the Person Becomes Unresponsive

If the person becomes unresponsive, carefully lower them to the ground. Follow the CPR AED procedure. Call 911 to activate EMS using a mobile device or activate your EAP if you haven't done so already. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess breathing for no more than 10 seconds. If the unresponsive person is not breathing normally or only gasping, remove any bulky clothing from the person's chest and immediately start high-quality CPR, beginning with chest compressions. Before opening the airway to provide rescue breaths, open the person's mouth wide. Only if you see an object, remove it with your fingers. Continue until another CPR provider, someone with more advanced training, or EMS providers arrive and take over, or until the person starts breathing, moving, or reacting in other ways.

Safety & Health Tip

Not chewing food well before swallowing, talking or laughing while eating, alcohol consumption, advancing age, and poorly fitting dental work are all risk factors for adult choking.

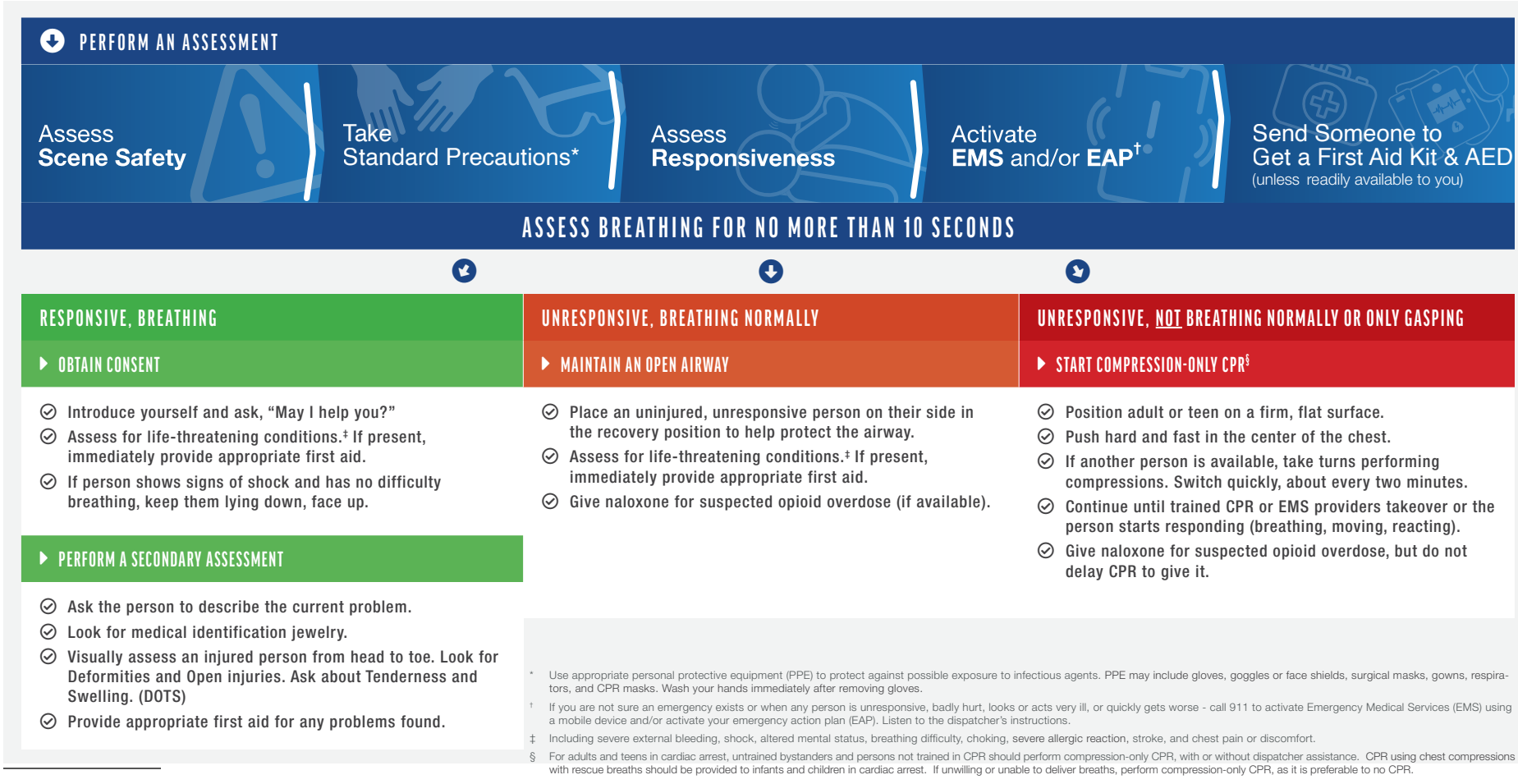
section two

ADULT FIRST AID

PROCEDURE FOR ADULT FIRST AID

A procedure is "a particular way of accomplishing something or of acting."[28] The *Procedure for Adult First Aid* is a step-by-step diagram with instructions that provide guidance for assessing, prioritizing, and performing first aid and compression-only CPR. The *Procedure for Adult First Aid* is modeled after "decision tree" type medical algorithms and is based on scientific evidence, national guidelines, and the consensus of experts.

There are different procedures for first aid and CPR AED depending on whether the person affected is an adult, child, or infant. The action you take also depends on your training as a first aid provider, a CPR AED provider, or both. Follow the procedure that aligns with your training. When an emergency occurs, it may not always be clear at first what kind of care the person needs. If you are a trained first aid, CPR AED provider, you will follow that procedure. If you are only trained in first aid, you will follow that procedure.



28 "Procedure," *Merriam-Webster.com Dictionary*, https://www.merriam-webster.com/dictionary/procedure [Retrieved 8/2/2021].

ADULT FIRST AID ASSESSMENT

The steps of assessment are crucial in all but the most minor circumstances. The main steps in assessment are the same, regardless of whether the provider is trained in first aid only, CPR AED only, or both. These steps are covered in depth in the Introductory Lessons beginning on page 5.

Assess Scene Safety

- As a single first aid provider, first assess scene safety.

Take Standard Precautions

- This includes taking Standard Precautions.[29]

Assess Responsiveness

- If the scene is safe, assess responsiveness. If the person appears unresponsive, tap them and ask loudly, "Are you okay?"

Activate EMS and/or EAP

- If the person does not respond, or is responsive and badly hurt, looks or acts very ill, or quickly gets worse, activate EMS and/or your EAP.
- When activating EMS, listen to and follow the dispatcher's instructions.

Send Someone to Get the First Aid Kit and an AED

- After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED.
- Even you are not a trained CPR provider, bring the AED with the first aid kit in case someone arrives to help that can operate it, as needed.

Assess Breathing

- Assess the person's breathing for no more than 10 seconds. Look at the chest and face for signs of normal breathing. Normal breathing is effortless, quiet, and regular.
- Take action based on the person's responsiveness and breathing.

29 In this program, "take Standard Precautions" means "use appropriate personal protective equipment (PPE). PPE is equipment worn in the workplace to minimize exposure to hazards that cause serious injuries and illnesses, such as blood or airborne organisms that can cause disease. Depending on your role as a first aid provider, appropriate PPE may include gloves, goggles or face shields, surgical masks, gowns, respirators, and CPR masks.

Unresponsive, Not Breathing Normally

Weak, irregular gasping, snorting, snoring, or gurgling sounds are known as agonal breaths. This is not normal breathing. It is a sign of cardiac arrest. If an unresponsive person is not breathing normally or only gasping, immediately start CPR.

Unresponsive, Breathing Normally

If the person is unresponsive and breathing normally, maintain an open airway. Place an uninjured, unresponsive person on their side in the recovery position to help protect the airway.

Assess for Life-Threatening Conditions

Rapidly scan the person for life-threatening conditions. Look for severe external bleeding, shock, altered mental status, severe allergic reaction, stroke, chest pain or discomfort, and other life-threatening conditions. If present, obtain consent and immediately provide appropriate first aid. Give naloxone for a suspected opioid overdose, if available.

Compression-Only CPR

For adults and teens in cardiac arrest, persons not formally trained in CPR should provide compression-only CPR, with or without dispatcher assistance. Position the adult or teen on a firm flat surface. Push hard and fast in the center of the chest. Continue until trained CPR or EMS providers take over or the person starts responding by breathing, moving, or reacting.

Responsive, Breathing

If the person is breathing and appears responsive, obtain consent. Introduce yourself and ask, “May I help you?” If the person consents, rapidly assess them for life-threatening conditions. If any life-threatening conditions are present, immediately provide appropriate first aid. If the person shows signs of shock, keep them lying down, face up.

Secondary Assessment

Consider performing a secondary assessment to gather more information while waiting for EMS. Ask the person to describe the current problem. Sometimes the problem is obvious, such as a visible wound. Other times you may need to ask about the person’s symptoms. A symptom is something felt or experienced, such as pain or dizziness.

Look for Medical Identification Jewelry

Medical identification jewelry can be a vital source of information in the event the person is unable to speak or becomes unresponsive. Look for a small emblem or tag worn on a bracelet or necklace or similar jewelry containing inscribed information, such as diabetes, epilepsy, food or drug allergies, and bleeding disorders.

Visually Assess the Person from Head to Toe

Visually assess the person from head to toe. Use the **DOTS** acronym as a guide. Look for **D**eformities and **O**pen injuries. Ask about **T**enderness and **S**welling. If necessary and with consent, remove or cut away clothing to get a better look at an injured or painful body part. Provide appropriate first aid for any problems found. Keep the person as comfortable as possible. Regularly reassess scene safety, responsiveness, breathing, and the effectiveness of first aid provided. Stay with the person until someone with more advanced training takes over or EMS arrives. Pass on any information gathered.

D	Deformities
O	Open Injuries
T	Tenderness
S	Swelling

Mechanism of Injury

The cause, or mechanism, of injury is the way in which the person sustained the injury; how the person was injured; or the process by which the injury occurred. There are many mechanisms of injury, including transportation-related mechanisms such as a motor vehicle, motorcycle, or bicycle crashes, and other causes such as falls, gunshots, suffocation, environmental exposure, poisoning, and injuries resulting from being hit or crushed.[30] When performing a secondary assessment, considering the mechanism of injury may help you predict the potential presence and severity of injuries – especially when they are not apparent, for example, internal bleeding or head and spine injuries.

Safety & Health Tip

Forklift operators and employees working around forklifts are at risk of injuries or death caused by being struck by the forklift. Only trained and certified forklift operators may operate a forklift. They should always maintain clear visibility of the work area and ensure they have enough clearance when raising, loading, and operating the equipment.

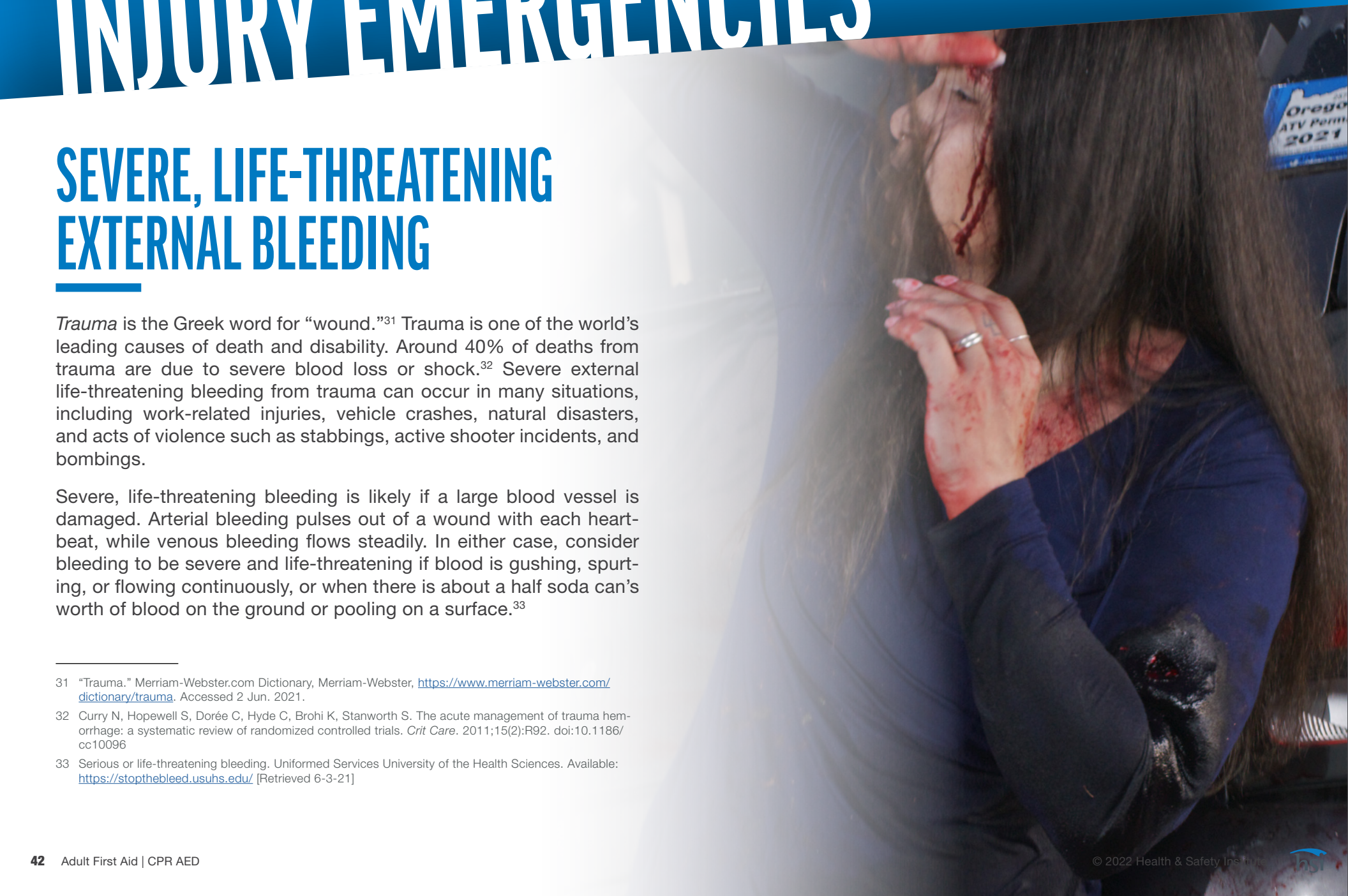
30 Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Definitions for Nonfatal Injury Reports. https://www.cdc.gov/injury/wisqars/nonfatal_help/definitions_nonfatal.html [Retrieved 12/1/21]

INJURY EMERGENCIES

SEVERE, LIFE-THREATENING EXTERNAL BLEEDING

Trauma is the Greek word for "wound."[31] Trauma is one of the world's leading causes of death and disability. Around 40% of deaths from trauma are due to severe blood loss or shock.[32] Severe external life-threatening bleeding from trauma can occur in many situations, including work-related injuries, vehicle crashes, natural disasters, and acts of violence such as stabbings, active shooter incidents, and bombings.

Severe, life-threatening bleeding is likely if a large blood vessel is damaged. Arterial bleeding pulses out of a wound with each heartbeat, while venous bleeding flows steadily. In either case, consider bleeding to be severe and life-threatening if blood is gushing, spurting, or flowing continuously, or when there is about a half soda can's worth of blood on the ground or pooling on a surface.[33]



31 "Trauma." Merriam-Webster.com Dictionary, Merriam-Webster, https://www.merriam-webster.com/dictionary/trauma. Accessed 2 Jun. 2021.

32 Curry N, Hopewell S, Dorée C, Hyde C, Brohi K, Stanworth S. The acute management of trauma hemorrhage: a systematic review of randomized controlled trials. *Crit Care*. 2011;15(2):R92. doi:10.1186/cc10096

33 Serious or life-threatening bleeding. Uniformed Services University of the Health Sciences. Available: https://stopthebleed.usuhs.edu/ [Retrieved 6-3-21]

Follow the Adult First Aid Procedure

Assess scene safety.

- If the scene is unsafe, do not approach it. If the scene is safe, take Standard Precautions. There are infectious microorganisms present in blood that can cause disease including hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV), but the average risk of infection from exposure to blood-borne illnesses is very low.[34]

Assess responsiveness.

- If the person is responsive, breathing, and bleeding is severe, call 911 to activate EMS using a mobile device or activate your EAP.

Send someone to get the first aid kit and an AED.

- After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. All first aid kits should include trauma pads and sterile gauze pads to stop bleeding. In workplaces that have a high risk of serious injuries, first aid kits are required to include a tourniquet.[35]
- A tourniquet is a tight, wide band placed around an arm or a leg and tightened to compress blood vessels and stop bleeding. Many lives could be saved with early use of a tourniquet for severe, external life-threatening bleeding.[36] In some public places, a bleeding control kit that includes a commercially manufactured, ready-made tourniquet may be available next to AEDs. If a bleeding control first aid kit is available nearby, get it or send someone else to.

Assess breathing for no more than 10 seconds.

- If the person is responsive, introduce yourself and ask, "May I help you?" If the person consents, immediately provide the appropriate first aid.

Stop the Bleeding

When a commercial tourniquet is available, use it as soon as possible after the injury to stop severe, life-threatening bleeding. Follow the manufacturer's instructions. The basic steps are as follows: place, turn, secure, and document.

Place

- Place the tourniquet at least 2-3 inches above the wound, between the torso and the wound. It may be applied over bare skin or clothing. Do not place the tourniquet over the wound or over a joint.
- Pull the free end of the tourniquet strap through the buckle. Pull the strap tight around the limb and fasten it.

Turn

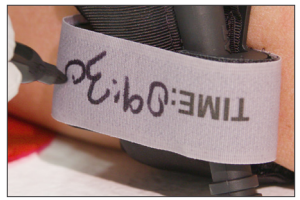
- Turn the windlass, rod, or knob and keep turning it until the bleeding stops. This is likely to be painful for the injured person.

Secure

- Secure the windlass or rod to the tourniquet so that it does not untwist.

Document

- Document the time that the tourniquet was applied. Some tourniquets have a white space on the strap where you can write the time. If not, record the time on a conspicuous location on the injured person. Do not loosen or remove the tourniquet.



If bleeding is not controlled with the first tourniquet, and a second one is available, it can be applied side by side with the first.

34 Exposure to Blood, What Healthcare Personnel Need to Know. Available: https://www.cdc.gov/hai/pdfs/bbp/exp_to_blood.pdf [Retrieved 6-3-21]

35 https://www.osha.gov/laws-regs/standardinterpretations/2019-06-19

36 Bonk C, Weston BW, Davis C, Barron A, McCarty O, Hargarten S. Saving Lives with Tourniquets: A Review of Penetrating Injury Medical Examiner Cases. Prehosp Emerg Care. 2020 Jul-Aug;24(4):494-499. doi: 10.1080/10903127.2019.1676344. Epub 2019 Dec 3. PMID: 31580174.

Direct Manual Pressure & Bandaging

When a manufactured tourniquet is not immediately available, or when the bleeding is somewhere other than an arm or leg, use direct manual pressure, preferably with a hemostatic dressing. A hemostatic dressing is a sterile gauze dressing impregnated with an ingredient that causes rapid coagulation of blood. Hemostatic dressings more rapidly control bleeding than use of direct pressure alone.[37]

If a hemostatic dressing is not available, use sterile trauma dressings, compressed gauze, or a stack of 10 sterile 4"x 4" gauze sponges.[38] If sterile dressings are not available, use any clean material available such as clothing, a towel, or other absorbent materials.

Direct manual pressure on the bleeding vessel is critical to stop bleeding.

- Use the heel of one hand with the other hand stacked on top of the first or use the pads of 3 fingers of each of hand stacked on top of each other.
- Push down hard onto the wound. Use continuous pressure.
- If blood soaks through the gauze or other material, press harder. Keep pressing hard until the bleeding stops.
- Don't remove pressure to add more gauze and don't remove blood-soaked materials.
- Once the bleeding stops, wrap an elastic or self-adhesive roller bandage firmly over the gauze or other material to help maintain pressure.

For severe life-threatening bleeding from the neck, shoulder, or groin, the first aid provider can pack, or stuff, the wound with hemostatic gauze, plain gauze, or if that is not available, a clean cloth.[39] Pack the gauze into the wound until no more goes in. Then, apply direct manual pressure. Push down hard on the wound. Keep pushing hard until the bleeding stops.

37 Pellegrino JL, Charlton NP, Carlson JN, Flores GE, Goolsby CA, Hoover AV, Kule A, Magid DJ, Orkin AM, Singletary EM, Slater TM, Swain JM. 2020 American Heart Association and American Red Cross Focused Update for First Aid. Circulation. 2020 Oct 27;142(17):e287-e303. doi: 10.1161/CIR.0000000000000900. [Retrieved 6.4.21]

38 Charlton, N. et al. Pressure Methods for Primary Hemorrhage Control: A Randomized Crossover Trial https://oaks.kent.edu/ijfae/vol2/iss1/pressure-methods-primary-hemorrhage-control-randomized-crossover-trial [Retrieved 6.4.21]

39 Stop the Bleed. Available : https://www.bleedingcontrol.org/~/media/bleedingcontrol/files/stop%20the%20bleed%20booklet.ashx [Retrieved 6/22/21]

Improvised Tourniquet

If a manufactured tourniquet is not available and direct manual pressure with or without the use of a hemostatic dressing fails to stop life-threatening bleeding on an arm or leg, consider using an improvised tourniquet if you are trained in its use.

An improvised tourniquet can be created using common materials such as a triangular bandage or clothing and a rigid stick-like object.

To improvise a tourniquet using a triangular bandage:

- Start by folding the bandage lengthwise so that it is approximately 2 inches wide.
- Place the center of the bandage a few inches above the wound site and not directly over a joint.
- Wrap the bandage firmly around the limb, bringing both ends back to the top.
- Tie half a knot over the top of the bandage.
- Place a rigid stick-like object on top of the half-knot and tie a full knot over it.
- Twist the stick and keep twisting until the bleeding stops.
- Secure the stick so it does not untwist.

Safety & Health Tip

Moving machine parts have the potential to cause severe bleeding, including at work and at home. These injuries can be avoided by following the manufacturer's recommended safety procedures, including maintaining proper machine guarding, wearing all required PPE, and using lockout/tagout procedures (safety procedures that ensure dangerous machines are properly shut off and not able to be started up again prior to the completion of maintenance or repair work).

SHOCK

Shock is a life-threatening condition that occurs when the body is not getting enough blood flow and oxygen to the body to function properly. Losing about one-fifth or more of the normal amount of blood in the body causes shock.

Shock can get worse very rapidly. As many as 1 in 5 people who suffer shock will die from it.[40] The greater and more rapid the blood loss, the more severe the symptoms of shock. In addition to severe bleeding, shock can result from heart problems, allergic reactions, infections, and damage to the nervous system.

Follow the Adult First Aid Procedure

Assess scene safety and take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess breathing for no more than 10 seconds. If the person is breathing and appears responsive, obtain consent.

Early signs of shock include complaints of nausea and fatigue. The person may appear uneasy, restless, worried, or confused. They may be extremely thirsty. You may notice changes in the appearance and condition of the person's skin. Pale, gray or ashen, sweaty, cool skin, and blue-tinged nail beds and lips are a result of not enough circulating red blood cells.

If a person shows signs of shock, and there is no difficulty breathing, keep them lying down, face up. Cover them to help maintain body temperature. If it is wet or cold, place a water-resistant cover beneath them if available. Give them nothing to drink, even if they complain that they are thirsty.

Consider Performing a Secondary Assessment While Waiting for EMS

Regularly reassess scene safety, responsiveness, breathing, and the effectiveness of first aid care provided. Stay with the person until someone with more advanced training takes over or EMS arrives.

40 https://medlineplus.gov/ency/article/000039.htm [Retrieved 06-07-21]

MINOR WOUNDS

Blood clotting normally occurs when there is damage to a blood vessel. Non-severe, mild external bleeding typically stops on its own or with direct manual pressure.

Minor wounds or abrasions to the skin surface should be thoroughly flushed with a large volume of warm or room temperature water with or without soap until there is no foreign matter in the wound. To control bleeding, apply continuous direct manual pressure with a sterile dressing or any clean available material for at least five minutes. The bleeding should stop or slow to an ooze or trickle.

If there are no known allergies to antibiotic ointment or cream, wounds heal better with less infection if they are covered with an antibiotic and a clean, occlusive dressing to seal off the wound and surrounding tissue from air or contaminants.[41] If a wound is bleeding heavily, saturating the gauze or dressing, treat it as severe external life-threatening bleeding.

Bleeding from the Mouth

For bleeding from the mouth, apply direct manual pressure to a bleeding site with sterile gauze until bleeding stops. If sterile gauze is not available, use the cleanest material available such as clothing, a towel, or other absorbent materials. Have the person lie on their side or sit up if injuries are not suspected to prevent blood from going into their airway or stomach.

If bleeding does not stop, maintain direct manual pressure and call 911 to activate EMS using a mobile device and/or activate your EAP.

41 Markenson D, et al . Part 17: first aid: 2010 American Heart Association and American Red Cross Guidelines for First Aid. *Circulation*. 2010;122(suppl 3):S934 –S946.

TOOTH INJURIES

A knocked-out permanent tooth does not necessarily mean it is lost for good. Proper first aid can save the tooth.

Always look for the tooth or have someone look for the tooth before leaving. Handle the tooth carefully when you pick it up. Do not touch the root of the tooth, only the chewing surface, called the crown. If the tooth is dirty, gently rinse, but do not scrub it. Use only water, not soap or other chemicals. Don't dry the tooth and don't wrap it in a tissue or cloth. *Keep the tooth moist at all times.*

Have the injured person try to put the tooth back into its socket right away. They should gently push it in with their fingers or position it above the socket and close their mouth slowly. Hold the tooth in place by gently biting down on it.[42]

If a knocked-out tooth cannot be immediately repositioned, prevent the tooth from drying out. Place the tooth in Hanks' Balanced Salt Solution or in an oral rehydration salt solution. If these are not available, enclose the tooth in plastic food wrap. If plastic wrap is not available, consider storing the tooth in cow's milk or the injured person's saliva.

Get the person to the nearest dentist or endodontist. Act quickly, within 30 minutes. The faster you act, the better the chance of saving the tooth.

Safety & Health Tip

Mouth guard use has been shown to reduce the risk of sport-related dental injuries.[43]

42 Knocked Out Teeth. American Association of Endodontists (AAE) Available: https://www.aae.org/patients/dental-symptoms/knocked-out-teeth/ [12.9.2021]

43 The American Dental Association. Available: https://www.ada.org/en/member-center/oral-health-topics/mouth-guards [Retrieved 8-31-21]

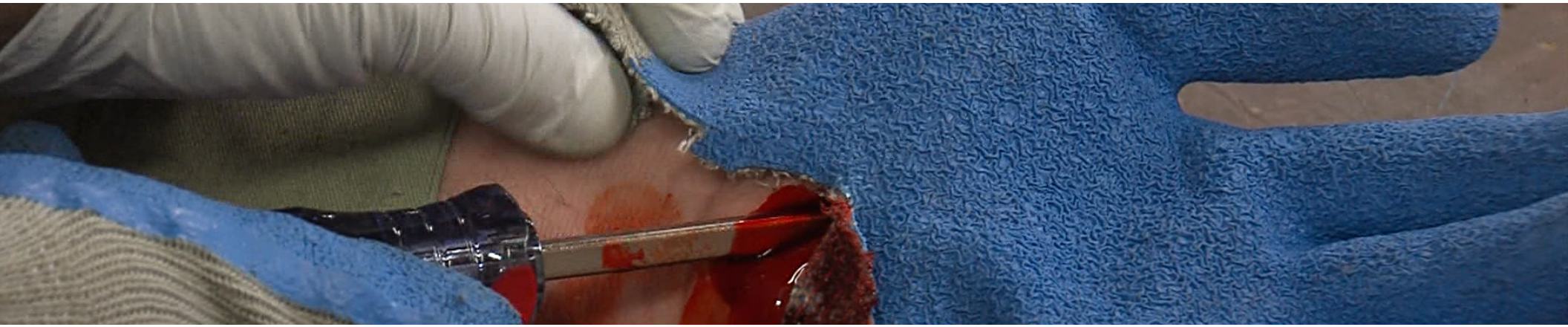
BLEEDING FROM THE NOSE

Nosebleeds can occur when small blood vessels inside the nostrils are ruptured. Most nosebleeds occur because of minor irritations or colds. Most nosebleeds are not serious and are rarely life threatening.

To care for someone with a nosebleed, have them sit up straight with their head tilted forward, chin down. When a person with a nosebleed leans back or lies down, blood drains down their throat and can cause vomiting. Pinch the soft portion of the nose with your thumb and index finger so the nostrils are closed. Hold it for about ten minutes.

If the bleeding does not stop after 20 minutes, call 911 to activate EMS using a mobile device and/or activate your EAP.

IMPALED OBJECTS



An impaled object is an object such as a knife, nail, or rod that penetrates a body part and remains embedded.

Follow the Adult First Aid Procedure

Assess scene safety, take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device or activate your EAP.

After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess breathing for no more than 10 seconds. If the person is breathing and appears responsive, obtain consent.

As a general rule, do not remove an impaled object. If it has damaged any large blood vessels, it can act like a plug, helping to prevent serious, life-threatening bleeding. If necessary, remove or cut away clothing to get a better look at the injury.

Place sterile bulky dressings over the wound and around the object to stabilize it in place. Control bleeding with direct manual pressure, preferably with a hemostatic dressing. Push down on the wound around the base of the object. Use continuous pressure until the bleeding stops. Do not apply pressure to the object itself. Once the bleeding stops, wrap an elastic or self-adhesive roller bandage firmly over the gauze or other material to help maintain pressure and stabilize the object.

Safety & Health Tip

The most common impalement hazard at a construction site is the steel bar that is used to reinforce concrete. Federal safety and health regulations for construction require that “all protruding reinforcing steel, onto and into which employees could fall, shall be guarded to eliminate the hazard of impalement” (Occupational Safety & Health Administration, 1926.701[b]).

EYE INJURIES

The impalement of an unprotected eye is most likely to be caused by a small object being propelled at a high rate of speed.

Follow the Adult First Aid Procedure

Assess scene safety, take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess breathing for no more than 10 seconds. If the person is breathing and appears responsive, obtain consent.

A first aid provider can help to stabilize the object and prevent additional injury. Do not allow the person to rub the eye.

Stabilize a large object with clean pads. Place a protective cover over the object, such as a paper cup or cone. With smaller objects, loosely cover the injured eye with an eye pad or sterile gauze dressing.

Calm, comfort, and reassure to help reduce anxiety. Stay with the person until someone with more advanced training takes over or EMS arrives.

Safety & Health Tip

According to the American Academy of Ophthalmology, wearing proper protective eyewear can prevent 90% of eye injuries.

AMPUTATION

Amputation is the complete detachment of a body part.

Follow the Adult First Aid Procedure

Assess scene safety, take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess breathing for no more than 10 seconds. If the person is breathing and appears responsive, obtain consent.

Bleeding may be minimal or severe depending on the location and nature of the injury. If life-threatening bleeding is present from the remaining part of an arm or leg, control it using a manufactured tourniquet.

Control minimal bleeding with continuous direct manual pressure for at least five minutes. Use a sterile dressing or any clean available material.

Amputated body parts can often be surgically reattached. Save any severed body parts and make sure they stay with the person.

- If possible, rinse the amputated part with clean water to remove any dirty material that may contaminate the wound.[44]
- Wrap the severed part in a sterile gauze sponge or clean cloth. Place the part in a tightly sealed plastic bag.
- Place the bag in a container filled with ice or ice water. Do not put the body part directly in water or on ice without using a plastic bag.
- Label the container with the person's name, the date and time. Give the container to EMS providers for transport with the person to the hospital.

Calm, comfort, and reassure the person. Reassess regularly until another provider or EMS takes over.

Safety & Health Tip

Amputations occur most often when workers operate unguarded or inadequately safeguarded machinery. Proper machine guarding; placing and enforcing safety rules; and ongoing supervision and employee training can help prevent and control amputation hazards.

44 Traumatic amputation. https://medlineplus.gov/ency/article/000006.htm

INTERNAL BLEEDING

Internal bleeding can result when the mechanism of injury involves significant force. External bleeding is easy to recognize. Internal bleeding can be more difficult.

Suspect internal bleeding if a person was struck with significant force. For example, a person could have internal bleeding if struck by a moving vehicle, equipment, or by a falling or flying object. A fall from a height or being struck forcibly in the abdomen or chest can also cause internal bleeding. If someone was stabbed or shot, coughs up or vomits blood, or has signs of shock without serious external bleeding, a first aid provider should take action for internal bleeding by following the adult first aid procedure.

Follow the Adult First Aid Procedure

Assess scene safety and take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess breathing for no more than 10 seconds. If the person is breathing and appears responsive, obtain consent.

If the person shows signs of shock and there is no difficulty breathing, keep the person lying down, face up. Ask the person to describe the current problem. Look for medical identification jewelry. Visually inspect an injured person from head to toe. Look for:

- Deformities
- Open injuries
- Tenderness
- Swelling

Provide appropriate first aid for any problems found. Regularly reassess scene safety, responsiveness, breathing and the effectiveness of first aid care provided. Stay with the person until someone with more advanced training takes over or EMS arrives.

Safety & Health Tip

Caught-between injuries occur when a person is crushed, pinched, or caught between a moving object and a stationary object, or between two moving objects. These hazards can cause life-threatening injuries including internal bleeding. The hazards can be controlled by using barricades to keep workers out of dangerous areas, training on hazard recognition, and safe work practices such as not standing or passing between swinging equipment, forklifts, or vehicles.

Pregnancy Complications

Internal bleeding may also relate to complications in pregnancy. Light, irregular discharge of blood through the vagina, or spotting, is normal in a pregnancy. Except for the bloody show of labor (a small discharge of blood mixed with mucus, signaling the onset of labor) any vaginal bleeding late during pregnancy is considered a warning sign. Serious symptoms suggesting very low blood pressure from excessive bleeding include a rapid heartbeat, presyncope (near-fainting), or syncope (fainting). [45]

45 Vaginal Bleeding During Late Pregnancy. Merck Manual, Consumer Version. Available: https://www.merckmanuals.com/home/women-s-health-issues/symptoms-during-pregnancy/vaginal-bleeding-during-late-pregnancy?query=bleeding%20pregnancy [Retrieved 12/2/21]

OPEN CHEST WOUND

A penetrating injury through the chest wall, such as those caused by a knife or gunshot, can trap air between the lung and chest wall, building up pressure and causing a collapsed lung.

Follow the Adult First Aid Procedure

Assess scene safety and take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess breathing for no more than 10 seconds. If the person is breathing and appears responsive, obtain consent.

If necessary and with consent, remove or cut away clothing to get a better look at the chest wound. You may hear a gurgling sound from the wound as the person breathes in. You may see bubbling blood around the wound. The person may show signs of shock and get worse quickly.

Some bleeding control kits include materials for vented chest seals to treat penetrating chest wounds. Unless you have training in the use of vented chest seals, it is okay to leave an open chest wound exposed, without a dressing or seal.[46] Check to see if there is an exit injury on the other side of the chest.

Use direct manual pressure, preferably with a hemostatic dressing, to control bleeding. Regularly reassess scene safety, responsiveness, breathing and the effectiveness of first aid care provided. Stay with the person until someone with more advanced training takes over or EMS arrives.

Safety & Health Tip

Federal OSHA believes that a well-written and implemented workplace violence prevention program (combined with engineering controls, administrative controls, and training) can reduce the incidence of workplace violence in both the private sector and federal workplaces.[47]

46 Singletary EM, et al.Part 15: first aid: 2015 American Heart Association and American Red Cross Guidelines Update for First Aid. Circulation. 2015;132(suppl 2):S574–S589.

47 Occupational Safety & Health Administration. Workplace Violence. Available: https://www.osha.gov/workplace-violence [Retrieved 9/13/21]

OPEN ABDOMINAL INJURY

Some penetrating injuries to the abdomen may result in evisceration, a protrusion of the abdominal organs outside the body.

Follow the Adult First Aid Procedure

Assess scene safety and take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess breathing for no more than 10 seconds. If the person is breathing and appears responsive, obtain consent.

Protect any protruding organs with sterile gauze moistened with sterile saline so the dressing does not stick to the organs. If sterile dressings are not available, use any clean material available such as clothing, a towel, or other materials moistened with clean water.

Several major blood vessels are in the abdomen. Suspect internal bleeding and watch for signs of shock. Allow the person to lie down in a position of greatest comfort to them (usually on their back or one side, with both knees drawn up). Do not allow the person to eat or drink.

Regularly reassess scene safety, responsiveness, breathing, and the effectiveness of first aid care provided. Stay with the person until someone with more advanced training takes over or EMS arrives.

HEAD, NECK, OR SPINAL INJURY

A person with a possible head, neck, or spinal injury should avoid moving too much, as unstable spinal column injuries can progress to severe nervous system injuries with excessive movement.[48]

First aid providers should suspect spinal column or cord injury if an injured person[49,50] is 65 years of age or older; was a driver, passenger, or pedestrian, in a motor vehicle, motorcycle, or bicycle crash; fell from a greater than standing height; has difficulty breathing; has tingling in the arms and legs; has pain or tenderness in the neck or back; has muscle weakness, loss of feeling or movement in the arms or legs; has an altered mental status or is intoxicated; has lost bladder and/or bowel control; or has other painful injuries, especially of the head and neck.

If the person can walk, move, and feel their arms and legs, it does not rule out the possibility of an unstable spinal injury. If you suspect an injured person has a spinal injury:

Follow the Adult First Aid Procedure

Assess scene safety and take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess breathing for no more than 10 seconds. If the person is breathing and appears responsive, obtain consent.

To avoid potential further injury, have the person remain as still as possible in the position in which they were found while you await the arrival of EMS providers. If the scene becomes unsafe, drag the person away from danger by the long axis of the body while keeping the spinal column as straight as possible.

If leaving the person in the position found is causing their airway to be blocked by vomit or other fluids, or if you need to leave an unresponsive injured person alone to get help, place the person in a recovery position to protect the airway. If the person becomes unresponsive and is not breathing normally or only gasping, start CPR.

Safety & Health Tip

Falls from portable ladders (step, straight, combination, and extension) are one of the leading causes of occupational fatalities and injuries. Be familiar and comply with safe ladder practices. Read and follow all labels/markings on the ladder before using it.

48 Spinal Motion Restriction in the Trauma Patient – A Joint Position Statement. Available: https://naemsp.org/home/news/spinal-motion-restriction-in-the-trauma-patient-%E2%80%93/ [Retrieved 6-9-21]

49 Markenson D, et al. Part 17: first aid: 2010 American Heart Association and American Red Cross Guidelines for First Aid. *Circulation*. 2010;122(suppl 3):S934 –S946. [Retrieved 6-9-21]

50 National Emergency Medical Services Education Standards, Emergency Medical Responder Instructional Guidelines 2009. Available: https://www.ems.gov/pdf/education/National-EMS-Education-Standards-and-Instructional-Guidelines/EMR_Instructional_Guidelines.pdf [Retrieved 6-9-21]

CONCUSSION

A concussion is a brain injury that generally results in less immediate or obvious signs. Most concussions are temporary and resolve naturally, but it is possible for one to progress into a life-threatening condition.

Suspect a concussion after a significant blow to the head or body when the affected person is unable to remember what happened just before or after the incident or recall simple facts about it. The person may move clumsily, answer questions slowly, or show a change in mood or personality. Additional signs include looking stunned or dazed, headache, nausea, vomiting, dizziness, difficulty in balance and/or coordination, and visual problems.

A trained first aid provider may be called upon to give advice on whether someone who may have a concussion is okay to return to normal activities. Unfortunately, there is no concussion evaluation process for use by first aid providers.

If you suspect a person may have a concussion, the person should be evaluated by a healthcare provider or EMS providers as soon as possible.

Safety & Health Tip

Head protection is crucial to safety. People working in areas where there is a possible danger of head injury from impact, or from falling or flying objects, must wear proper head protection.

BONE, JOINT, & MUSCLE INJURIES

Bones, muscles, and joints give the body shape, allow movement, and protect vital internal organs.

There are four different types of injuries affecting bones, muscles, and joints.

- Strains are stretching or tearing injuries to muscles or tendons.
- Sprains are tearing injuries to ligaments that hold joints together.
- Dislocations are the separation of bone ends at a joint.
- Fractures are breaks in bones.

Use the DOTS mnemonic as a guide. Strains, sprains, dislocations, and isolated fractures can be extremely painful but are not usually life-threatening. However, fractures of the pelvic or thigh bones may result in serious internal blood loss and shock.

D	Deformities
O	Open Injuries
T	Tenderness
S	Swelling

Follow the Adult First Aid Procedure

Assess scene safety and take Standard Precautions. Assess responsiveness. If you are not sure an emergency exists, or if the person looks badly hurt or quickly gets worse, call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess breathing for no more than 10 seconds. If the person is breathing and appears responsive, obtain consent.

Encourage the person to not move or use the injured limb. Check to see if there is an open wound. With consent, gently cut or tear away clothing to expose the injury site. Control any bleeding using a clean dressing and firm, continuous, direct manual pressure on the bleeding site. Do not push a bone back under the skin. Cover it with a sterile dressing.

Use padding in the gaps around it to provide a stable and comfortable spot for the limb to rest. If needed, place your hands above and below the injured area to help keep the limb still. It is best to not straighten an injured limb that is unnaturally angled. Leave it in the position found.

Cold application decreases bleeding, swelling, pain, and disability. Cooling is best accomplished with a plastic bag filled with a mixture of ice and water, which is better than ice alone. To prevent cold injury, limit each application of cold to no more than 20 minutes. Place a barrier, such as a thin towel, between the plastic bag and the skin. If a limb becomes blue or extremely pale, circulation may be cut off. If this occurs and you have not yet done so, activate EMS and/or your EAP.

Splinting

Splinting an injured limb can reduce pain and prevent further injury, especially when moving an injured person. In general, it is best to rely on EMS providers to splint, as they have more training, experience, and equipment.

Malleable Splints

In more populated, complex, or high-risk workplaces, first aid kits are required to include a malleable splint. This splint is a compact, lightweight, highly versatile device designed for immobilizing bone and soft tissue injuries in emergency settings. When needed it can easily be molded and shaped to create a rigid and stable splint.

- Shape the splint to match the contours of the limb by using the opposite, uninjured limb.
- Once rigid and shaped, the splint can be held in place with tape, self-adhesive roller or elastic bandages, or plastic cling film.
- If the hand is involved, place a roller gauze or elastic bandage in their injured hand to allow the fingers to curl around it. This keeps the hand in a natural position of function and is more comfortable.

Caution should be use with elastic bandages and cling film because it is easy to apply them too tightly.

After splinting, check frequently for discoloration, coolness, or numbness in the hand or foot. If necessary, loosen the splint to improve blood flow.

Improvised Splints

Splints can be improvised with commonly available items.

- Something rigid to provide external stability – things such as another part of the body, a compressed pillow, cardboard, folded magazine, or wood slat.
- Something soft to fill and support the contoured gaps around joints and bony ridges – things such as pads, towels, coats, pillows, or blankets.
- Something to bind the limb, rigid material, and padding together – things such as roller bandage, folded cloth bandages, strips of clothing, tape, belts, or rope.

Place padding on the rigid material where tapered surfaces of the limb, like around joints, will rest.

Place the rigid material alongside or underneath the injured limb, making sure it extends beyond the joints above and below. Bind the rigid material firmly to the limb. Do not bind the limb over the injury site.

Wrap both sides of a joint to immobilize the joint. Allow the hand or foot to assume a natural position. Secure the material tightly enough to provide stabilization, but not tight enough to restrict blood circulation.

When a joint cannot be immobilized with the rigid material, you can stabilize it against another body part, such as using a sling and swathe wrap to secure the elbow to the torso.

Safety & Health Tip

Slips, trips, and falls cause hundreds of workplace deaths per year and thousands of injuries (U.S. Bureau of Labor Statistics). Here are some preventions tips: Carry only what you can safely handle, especially if the load interferes with your ability to see where you're going. Avoid storing boxes or other items on walking surfaces where people might trip over them. Don't hurry, especially around corners. When ascending or descending stairs, use railings and handrails. Take one step at a time when going up or down stairs. Report worn, broken, or loose stair treads.

BURNS

A burn is an injury to skin, and possibly underlying tissues, caused by an exposure to extreme heat, chemicals, or electrical contact. Common causes of thermal burns include direct contact with hot liquids, flames, steam, or hot objects. Burns can also be caused by radiant heat from a hot environment or extended exposure to the sun. The severity of a burn is related to its depth and size. Deeper burns resulting in blistering or broken skin are more serious. Larger burns, even those with a shallow depth, are also more serious.

Minor Thermal Burns

Cool thermal burns with cold, but not ice-cold, tap water as soon as possible and for at least ten minutes. Don't apply ice directly to a burn. If you don't have cold water, use a cool or cold, but not freezing, clean compress. Continue cooling at least until the pain is relieved. Cooling reduces pain, swelling, and depth of injury. After cooling, loosely cover the burn with a dry, non-stick sterile or clean dressing. Leave blisters intact as it improves healing and reduces pain. Avoid natural burn remedies such as honey or potato peels. Never apply butter, ointment, lotion, or antiseptic to a serious burn.

Severe Thermal Burns

Burn location contributes to severity. Burns involving the face, neck, hands, genitals, joints, and feet can result in complications related to movement and other basic functions. Difficulty breathing as a result of inhaling hot air indicates a serious injury within the airway.

Follow the Adult First Aid Procedure

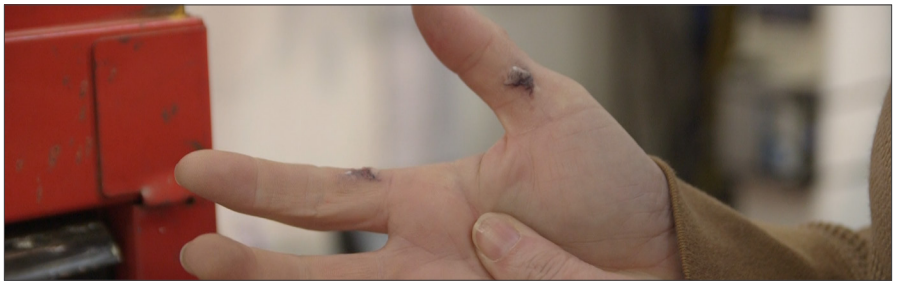
Assess scene safety and take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess breathing for no more than 10 seconds. If the person is breathing and appears responsive, obtain consent.

If the person's clothing is on fire, put it out. Tell the person to stop, drop, and roll; smother the burning material with a wet blanket; or douse the clothing with water. Carefully remove any jewelry and clothing that is not stuck to the skin, then immediately cool the burns with cool running water for at least 20 minutes. This first aid treatment is associated with improved outcomes in large burn injuries.[51]

A presoaked burn dressing can be used to cool a small thermal burn when clean, cool running water is not available. These sterile dressings are soaked in a specially formulated cooling gel designed to cool a burn, relieve pain, and prevent contamination. Regularly reassess scene safety, responsiveness, breathing and the effectiveness of first aid care provided. Stay with the person until someone with more advanced training takes over or EMS arrives.

Electrical Burns

Medical emergencies involving electricity can occur when there is direct contact with an energized object, such as an electrical wire or outlet or when someone is struck by lightning.



Follow the Adult First Aid Procedure

Assess scene safety. **Turn off any electrical current before touching the person. If you cannot stop the flow of electricity, do not enter the area around the person or attempt to care for them**. Keep others away. Once the power is off, take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess breathing for no more than 10 seconds. An electric shock can cause cardiac arrest. If the person is unresponsive and not breathing normally or only gasping, start CPR.

If the person is responsive and breathing, obtain consent. When a body part comes into contact with an exposed electrical source, electricity can travel from the point of contact to a second point of contact that is grounded. Common points of contact include the hands and the feet. Assess for external burns at any suspected points of contact. Cool the burn as you would with a thermal burn. If the person shows signs of shock, and there is no difficulty breathing, keep them lying down, face up. Cover them to help maintain body temperature. Regularly reassess scene safety, responsiveness, breathing and the effectiveness of first aid care provided. Stay with the person until someone with more advanced training takes over or EMS arrives.

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51 Harish V, Li Z, Maitz PKM. First aid is associated with improved outcomes in large body surface area burns. Burns. 2019 Dec;45(8):1743-1748. doi: 10.1016/j.burns.2019.05.006. Epub 2019 Oct 10. PMID: 31606315. [Retrieved 6-9-21]

Chemical Burns

For chemical burns, first consider if it is safe for you to help without exposing yourself to a harmful chemical.

Follow the Adult First Aid Procedure

Assess scene safety and take Standard Precautions. Assess responsiveness. If you are not sure an emergency exists, or if the person looks badly hurt or quickly gets worse, call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess breathing for no more than 10 seconds. If the person is breathing and appears responsive, obtain consent.

Brush off any dry chemical powder first. Adding water to dry chemical powders can make them corrosive and capable of burning or destroying skin.

Corrosive liquid chemicals such as concentrated sulfuric acid immediately damage skin tissue on contact. Act quickly. Remove contaminated clothing to minimize continued exposure and immediately flood the affected area with large amounts of water.

In workplaces with potentially harmful chemicals or materials, use the safety shower. Flush for at least 15 minutes. If still painful, continue flushing. Corrosive chemicals splashed into an eye can quickly damage eye tissue. Immediately flood the eye with large amounts of water. Carefully hold the eye open and flush outward from the nose side of the affected eye to prevent contamination of an unaffected eye. Flush continuously for at least 15 minutes, or until EMS personnel take over. If the person is wearing contact lenses and they are not removed by the flushing, have the person try to remove them as flushing continues. If running water is not available, normal saline or another commercial eye irrigating solution can be used.

Safety & Health Tip

According to the American Burn Association, more than 73% of burn injuries occur in the home. Visit their website ameriburn.org/prevention/prevention-resources/ to learn how to make simple environmental and behavioral changes to keep your family safe and to save lives.

Hazard Communication

To ensure chemical safety in the workplace, information about the identities and hazards of the chemicals must be available and understandable to workers. Chemical manufacturers and importers are required to evaluate the hazards of the chemicals they produce or import and prepare labels and safety data sheets (SDS) to convey the hazard information to their customers. All employers with hazardous chemicals in their workplaces must have labels and safety data sheets for their exposed workers, and train them to handle the chemicals appropriately.[52] If you are a first aid provider in a workplace with chemical hazards, it is essential that you not only know how to handle the chemicals appropriately but are well versed in the appropriate first aid for chemical exposure.

52 Hazard Communication. Occupational Safety & Health Administration. Available: https://www.osha.gov/hazcom [Retrieved 12/1/21]

MEDICAL EMERGENCIES

ALTERED MENTAL STATUS

An alteration in mental status refers to a change in awareness, such as confusion, loss of alertness, disorientation, or bizarre, inappropriate, or combative behavior, without a loss of consciousness.

An altered mental status is caused by a wide range of diseases, illnesses, and injuries, including traumatic brain injury, intoxication, infection, stroke, seizures, low oxygen levels, and diabetes.

An altered mental status is an important warning sign of a potentially life-threatening condition.

Follow the Adult First Aid Procedure

Assess scene safety and take Standard Precautions. Assess responsiveness. If you are not sure an emergency exists, or if the person looks badly hurt or quickly gets worse, call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess breathing for no more than 10 seconds. If the person is breathing and appears responsive, obtain consent.

Assess for any other life-threatening conditions. If a person with an altered mental status becomes unresponsive, place them on their side in the recovery position to help protect the airway. If they stop breathing or are only gasping, start CPR.

POISONING

A poison is any substance that can enter the body and cause sickness or death. A poison can be swallowed, inhaled, injected, or absorbed through the skin.

Poisons can include prescription or over-the-counter medicines taken in doses that are too high; overdoses of illegal drugs; carbon monoxide from gas appliances; household products, such as laundry detergent or furniture polish; pesticides; and indoor or outdoor plants. Peak poisoning frequency occurs in children 1-2 years old, but poisonings in teens and adults are far more serious. Pain medications lead the list of the most common substances involved in adult poisoning. Most poisonings are unintentional.[53]

53 US Poison Statistics National Data 2019. Available: https://www.poison.org/poison-statistics-national [Retrieved 6-10-21]

Adult — Suspected Opioid-Associated Emergency (OAE)

Accidental drug overdose is currently a leading cause of death in the United States for those under 50.

The majority of drug overdose deaths involve a prescription or illicit opioid such as oxycodone, hydrocodone, morphine, fentanyl, or heroin. Many opioids are taken in pill form, but they can also be taken as lozenges or lollipops, by injection or through an IV, or by a skin patch or a suppository.

Recognizing an opioid overdose can be difficult. Signs of an overdose may include:

- Small, constricted "pinpoint pupils,"
- Changes in skin appearance and condition,
- Falling asleep or loss of consciousness,
- Slow, shallow breathing,
- Choking or gurgling sounds, and
- Limp body.

Opioids can cause death by slowing, and eventually stopping, a person's breathing. A quick response to an opioid overdose, including administering naloxone, can prevent brain injury and death. Naloxone is a medication approved by the Food and Drug Administration (FDA) designed to rapidly reverse opioid overdose. Naloxone is available without a prescription in all U.S. states, the District of Columbia, and Puerto Rico.

Using Narcan® Nasal Spray

Narcan® Nasal Spray is the most commonly prescribed opioid reversal medication. To use Narcan® Nasal Spray, peel back the package to remove the device. Hold the device with your thumb on the bottom of the plunger and 2 fingers on the nozzle. Place and hold the tip of the nozzle in either nostril until your fingers touch the bottom of the person's nose. Press the plunger firmly to release the dose into the nose.

Follow the Adult First Aid Procedure

If you suspect a person has overdosed on a prescription or illicit opioid, follow the adult first aid procedure. Assess scene safety. If the scene is safe, take Standard Precautions. **Avoid contact with drug residue, containers, needles, and other paraphernalia.** Assess responsiveness. Tap the victim and ask loudly, "Are you okay?" If the person is unresponsive, call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit, naloxone, and an AED. Assess the person's breathing for no more than 10 seconds.

If the unresponsive person is not breathing normally or only gasping, immediately start CPR, beginning with chest compressions. For adults and teens in cardiac arrest, persons not trained in CPR should perform compression-only CPR. Give naloxone as soon as you can, but do not delay CPR to give it.

If the unresponsive person is breathing normally, give naloxone if available. To help protect the airway, place the person in the recovery position. If the person does not respond, another dose may be given in the same way. Narcan® Nasal Spray may be dosed every 2 to 3 minutes, if available.

Swallowed Poisons

If you suspect a person has ingested something poisonous, act quickly. If the product swallowed is burning, irritating, or caustic, and the person is responsive, not having seizures, and is able to swallow, have them drink a small amount of water or milk immediately.[54] Then get help from Poison Control.

In the United States, calling the national Poison Help line at

1-800-222-1222

automatically transfers you to a regional poison control center. You will speak with a specially trained nurse, pharmacist, or doctor.

Poison control centers can quickly provide information regarding the immediate treatment to exposure of any substance. It's free and confidential.

If a poisoned person collapses, has a seizure, has trouble breathing, or is unresponsive, follow the adult first aid procedure. Call 911 to activate EMS using a mobile device and/or activate your EAP. Assess breathing for no more than 10 seconds. Provide the appropriate first aid.

Inhaled Poisons

Inhaled poisoning occurs when a gas or chemical is breathed into the body. Symptoms depend on which gas or chemical is inhaled, how deeply, and for how long. Symptoms of an inhaled poison may include irritation of the eyes or nose, cough, blood in the sputum, and shortness of breath. Inhaled gases may cause breathing difficulty because they are poisonous to the body's cells, or because they displace oxygen in the blood and cause suffocation, like carbon monoxide.

A common household exposure to a poisonous chemical gas occurs when a person mixes household ammonia with cleansers containing bleach. Chemical hazards and toxic substances can present a wide range of health and physical hazards in the workplace. A quick and safe response to an unexpected release of these substances requires pre-planning, proper emergency response training, and specialized PPE such as positive pressure self-contained breathing apparatus (SCBA).

Follow the Adult First Aid Procedure

If the scene appears unsafe, do not approach it. If there is an immediate danger to the victim, and you can take action without placing yourself at unreasonable risk, get the victim to the fresh air immediately. Place an uninjured, unresponsive person on their side in the recovery position to help protect the airway. If an unresponsive person is not breathing normally or only gasping, immediately start CPR.

Safety & Health Tip

Carbon monoxide (CO) is harmful when breathed because it displaces oxygen in the blood and deprives the heart, brain, and other vital organs of oxygen. Large amounts of CO can overcome you in minutes without warning, causing you to lose consciousness and suffocate. Avoid the use of gas-powered engines, such as those in powered washers as well as heaters and forklifts, while working in enclosed spaces. Find out more at osha.gov/publications/bytopic/carbon-monoxide.

54 First Aid for Poisonings. Available: https://www.poison.org/first-aid-for-poisonings [Retrieved 6-10-21]

DIFFICULTY BREATHING

With the exception of feeling winded from normal activity, such as exercise, normal breathing is even and effortless. Difficulty breathing is the sensation of not being able to get enough air, even after discontinuing an activity that might cause breathlessness. It is almost always a medical emergency. There are many different causes, including chronic health conditions such as asthma, and sudden onset emergencies such as heart attack, stroke, allergic reaction, and airway obstruction.

Follow the Adult First Aid Procedure

Assess scene safety. Take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit, naloxone, and an AED. Assess the person's breathing for no more than 10 seconds. If the person is breathing and responsive, obtain consent.

Responsive Person

A responsive person having difficulty breathing is likely to be very anxious and agitated; sitting up and breathing rapidly; coughing, wheezing, or making whistling sounds; and having difficulty speaking.

There may be changes in the person's skin appearance and condition, such as sweaty, cool skin, and blue-tinged nail beds and lips.

Allow the person to find the most comfortable position in which to breathe, typically sitting up. With consent, help them loosen any restrictive clothing. Regularly reassess scene safety, responsiveness and breathing. The situation can quickly become life-threatening as a person becomes exhausted from gasping for air. Be prepared to provide CPR if the person becomes unresponsive and stops breathing or is only occasionally gasping or makes snorting, snoring, or gurgling sounds.

If you suspect a person has overdosed on a prescription or illicit opioid, follow the adult first aid procedure. Assess scene safety. If the scene is safe, take Standard Precautions. Assess responsiveness. Tap the victim and ask loudly, "Are you okay?" If the person is unresponsive, call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit, naloxone, and an AED. Assess the person's breathing for no more than 10 seconds.

ASTHMA

Asthma is a medical condition in which certain things can trigger a physical reaction in the lungs and make it difficult to breathe. Asthma triggers include allergens such as pollen and molds; irritants such as smoke, fumes, and dust; medications, such as aspirin or acetaminophen; extreme weather conditions; and exercise or stress.

When symptoms get worse, it is called an asthma attack. In an asthma attack, the small airways in the lungs narrow due to swelling and the production of mucus. Airflow into and out of the lungs is restricted. The person may wheeze, cough, or feel tightness in their chest. The symptoms can range from mild to severe. A person with asthma may use a metered-dose inhaler (with or without a spacer) to deliver a quick-relief medication to help control symptoms. Occasionally, due to the degree of difficulty breathing, the person may need help assembling and using their inhaler.

Using an Inhaler Without a Spacer

To use an inhaler without a spacer, first take the cap off. Look inside the mouthpiece and make sure there is nothing in it. Shake the inhaler hard 10-15 times before each use.

Breathe Out.

- Have the person breathe out all the way; encourage them to push out as much air as they can.

Breathe In.

- Hold the inhaler with the mouthpiece down. Have them place the mouthpiece between their teeth and close their lips around the mouthpiece to make a tight seal.
- As they start to slowly breathe in, press down on the inhaler one time. Have them keep breathing in as slowly and deeply as they can.

Hold Breath.

- Have them take the inhaler out of their mouth and if they can, hold their breath for a slow count of 10. This lets the medicine reach deep into the lungs.

Breathe Out.

- Have the person pucker their lips and breathe out slowly through their mouth.

If more than one dose is needed, repeat the steps. Replace the cap.

Using an Inhaler with a Spacer

Some inhalers have a spacer that connects to the mouthpiece of the inhaler. The inhaled medicine goes into the spacer tube first for more efficient delivery. To assist, take the cap off the inhaler and spacer. Look inside the mouthpieces of the inhaler and spacer to make sure they are clear. Shake the inhaler hard 10-15 times before each use. Attach the spacer to the inhaler. The steps are the same as using an inhaler without a spacer except, when ready, the person breathes in through the mouthpiece of the spacer instead of the inhaler.

Call 911 to activate EMS using a mobile device and/or activate your EAP, and get the first aid kit and AED if the person:

- Does not have their inhaler,
- Gets no better or gets worse after using their inhaler,
- Has difficulty speaking, or
- Becomes unresponsive.

Be prepared to provide CPR if the person becomes unresponsive and stops breathing or is only occasionally gasping or makes snorting, snoring, or gurgling sounds.

SEVERE ALLERGIC REACTION

A severe allergic reaction, known as anaphylaxis, is an extreme response of the body's immune system to something it is sensitive to. Common things that can initiate a severe reaction include bee stings, peanuts, latex, seafood, and penicillin.

When anaphylaxis occurs, the airway can become constricted due to swelling of the throat, making it difficult to breathe. Wheezing may be heard. Swelling of the lips, eyelids, and face may occur. Itchy raised lumps, or hives, can appear on the face and chest. The person may complain of nausea and abdominal cramping. Their voice may sound hoarse. A severe allergic reaction can develop rapidly. In general, the faster the reaction occurs, the more severe it is. Without treatment, death can occur within minutes.

Follow the Adult First Aid Procedure

Assess scene safety. If the scene is unsafe, do not approach it. Take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit, naloxone, and an AED. Assess the person's breathing for no more than 10 seconds. If the person is breathing and responsive, obtain consent.

A person with a history of allergic reactions may carry an epinephrine autoinjector that has been prescribed to them. Autoinjectors use a spring-loaded needle to rapidly administer a measured, single dose of epinephrine. Epinephrine can quickly reverse the effects of the reaction and may be lifesaving.

If a person is unable to self-administer an injection, the first aid provider may be able to do it for them. Individual state laws and regulations may allow laypersons to obtain and administer epinephrine for a person experiencing anaphylaxis, but may prescribe specific practices, rules, and standards for epinephrine autoinjector administration.

Using an Epinephrine Autoinjector[55]

The EpiPen® autoinjector is a commonly used epinephrine delivery device. Available in both adult and child dosages, it is designed to work through clothing.

Prepare

- Remove the EpiPen® from the carrier tube and check the autoinjector to make sure the blue safety release is not raised. If the blue safety release is not raised, the autoinjector is okay to use.
- Grasp the autoinjector in your fist with the orange tip (the needle end) pointing downward. With your other hand, remove the blue safety release by pulling straight up without bending or twisting it.
- To avoid an accidental injection, never put your thumb, fingers, or hand over the orange tip.

Administer

- Place the orange tip against the middle of the outer thigh at a right angle to the thigh. Swing and push the autoinjector firmly until it 'clicks.' The click signals that the injection has started.
- Hold firmly in place for 3 seconds. Count slowly 1 – 2 – 3. The injection is now complete.
- Remove the autoinjector from the thigh. The orange tip will extend to cover the needle. If the needle is still visible, do not attempt to reuse it.
- Massage the injection area for 10 seconds.

Activate EMS and/or your EAP if you haven't done so already. Consider giving a second dose with a new epinephrine autoinjector if one is available, symptoms persist, and EMS is still 5-10 minutes away.

Regularly reassess scene safety, responsiveness, breathing and the effectiveness of first aid care provided. Stay with the person until someone with more advanced training takes over or EMS arrives.

Give the used autoinjector to EMS providers for proper disposal or follow your employer's bloodborne pathogens exposure control plan.

Safety & Health Tip

Up to 75% of people with a history of severe anaphylactic reaction to a sting will experience severe symptoms when stung again.[56] People with a history of severe allergic reactions to insect stings should consider carrying an epinephrine autoinjector and wearing a medical identification bracelet or necklace stating their allergy.

55 EPIPEN – epinephrine injection. Available : https://dailymed.nlm.nih.gov/dailymed/fda/fdaDrugXsl.cfm?type=display&setid=7560c201-9246-487c-a13b-6295db04274a#section-15 [Retrieved 12/9/21]

56 Bonifazi F, Jutel M, Biló BM, Birnbaum J, Muller U; EAACI Interest Group on Insect Venom Hypersensitivity. Prevention and treatment of hymenoptera venom allergy: guidelines for clinical practice. *Allergy*. 2005 Dec;60(12):1459-70. doi: 10.1111/j.1398-9995.2005.00960.x. PMID: 16266376.

HEART ATTACK

Acute coronary syndrome is a medical term used to cover a broad range of conditions where the blood and oxygen supply to the heart muscle is suddenly blocked. One such condition is a myocardial infarction, commonly known as a heart attack. The myocardium refers to the muscular tissue of the heart. The word "infarction" comes from Latin and means "to plug up or cram." This cramming is typically caused by arteriosclerosis, a chronic disease that causes plaque (cholesterol and other substances found in the blood) to thicken, harden, and narrow the coronary arteries.

When the preexisting coronary artery plaque breaks, a blood clot forms and lodges in the blood vessel, blocking the flow of blood and oxygen to the heart muscle, causing a heart attack. Less commonly, a severe spasm, or sudden contraction, of a coronary artery can stop blood flow to the heart muscle. The more time that passes without treatment to restore blood flow, the greater the damage to the heart muscle.

The symptoms of a heart attack vary from person to person. Heart attacks can start slowly and cause only mild pain or discomfort. Symptoms can be mild, or more intense and sudden. Symptoms also may come and go over several hours. The most common symptom is chest pain or discomfort. Other symptoms include upper body discomfort, such as pain or discomfort in the left arm, both arms, the upper back, neck, jaw, or stomach. Shortness of breath, feeling weak, lightheaded, or faint, and cold, clammy, sweaty skin can occur with heart attack, as well as nausea and vomiting. Women are somewhat more likely to have shortness of breath, nausea and vomiting, unusual tiredness (sometimes for days) and pain in the back, shoulders, and jaw. [57]

Sudden cardiac arrest (SCA) occurs when the normal electrical impulses in the heart cause it to beat too quickly, inefficiently, or in an unsynchronized manner. SCA results from a problem with the heart's electrical system. With SCA, the heart suddenly and unexpectedly stops beating. Blood flow to the body, along with the oxygen it carries, abruptly stops. Cardiac arrest happens suddenly, and often without any warning signs. A victim of SCA will be unconscious, unresponsive, and not breathing normally or only gasping.

With a heart attack, the heart generally continues to beat, despite the blockage, and the person remains conscious and responsive. A person who is having a heart attack may deny it. But delays to medical care can jeopardize the person's life.

57 Heart Attack. National Heart, Lung, and Blood Institute. Available: https://www.nhlbi.nih.gov/health-topics/heart-attack [Retrieved 3/4/2021]

Follow the Adult First Aid Procedure

Assess scene safety. If the scene is unsafe, do not approach it. Take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit, naloxone, and an AED. Assess the person's breathing for no more than 10 seconds. If the person is breathing and responsive, obtain consent.

Calm, comfort, and reassure the person. With consent, loosen any tight clothing. Allow them to find a comfortable position. The early administration of aspirin for heart attack can be lifesaving. Unless the person has a known allergy to aspirin or has been advised by a healthcare provider not to take aspirin, encourage the person to take aspirin. The suggested dose is 1 adult 325-mg tablet, or 2-4 low-dose "baby" aspirins, 81 mg each, chewed and swallowed.[58] The aspirin should not be coated.

Stay with the person until someone with more advanced training takes over or EMS arrives. Be prepared for the possibility of sudden cardiac arrest, and the need for CPR and the use of an AED.

Safety & Health Tip

To help reduce your risk of heart attack and improve your heart health: Take aspirin as directed by your healthcare professional. Control your blood pressure. Manage your cholesterol. Don't smoke.[59]

58 Singletary EM, et al. Part 15: first aid: 2015 American Heart Association and American Red Cross Guidelines Update for First Aid. *Circulation*. 2015;132(suppl 2):S574–S589.

59 ABCS of Heart Health. Available: https://millionhearts.hhs.gov/data-reports/factsheets/ABCS.html [Retrieved 09.07.21]

STROKE

A stroke, sometimes called a brain attack, occurs when the blood supply to a portion of the brain is suddenly interrupted. This most commonly occurs when a blood clot obstructs a blood vessel in the brain, such as an ischemic stroke. A stroke can also occur when a weak spot in a blood vessel wall, known as an aneurysm, bursts open and bleeds into surrounding brain tissue. In either case, parts of the brain become damaged or die. A stroke can cause lasting brain damage, long-term disability, or even death.

Follow the Adult First Aid Procedure

Assess scene safety. If the scene is unsafe, do not approach it. Take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit, naloxone, and an AED. Assess the person's breathing for no more than 10 seconds. If the person is breathing and responsive, obtain consent.

Use the memory aid FAST to recognize the warning signs of stroke.

F	**Face**: Ask the person to smile. Does one side of the face droop?
A	**Arms**: Ask the person to raise both arms. Does one arm drift downward?
S	**Speech**: Ask the person to repeat a simple phrase. Is the speech slurred or strange?
T	**Time**: If you see any of these signs, it is time to activate EMS or your EAP.

DO NOT give aspirin for a suspected stroke. Unlike a suspected heart attack, do not give aspirin for a suspected stroke. As a blood thinner, aspirin can increase bleeding and potentially worsen a stroke.

DO NOT give supplemental oxygen for a suspected stroke. There is no clear benefit.

Regularly reassess scene safety, responsiveness, and breathing. Stay with the person until someone with more advanced training takes over or EMS arrives.

Safety & Health Tip

Some of the most important treatable risk factors for stroke are high blood pressure, cigarette smoking, history of stroke or brief stroke-like symptoms, diabetes, cholesterol imbalance, physical inactivity, and obesity. Although stroke risk is never zero at any age, by starting early and controlling your risk factors you can lower your risk of death or disability from stroke.[60]

60 Brain Basics: Preventing Stroke. National Institute of Neurological Disorders and Stroke. Available: https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Preventing-Stroke [Retrieved 9/8/21]

SEIZURE

Generalized seizures are triggered by excessive electrical activity within the brain. Symptoms may include sustained rhythmical jerking movements, with muscles becoming weak or limp, then tense or rigid. There may be brief muscle twitching, or the body may flex and extend repeatedly.[61] While there are many conditions that can cause a seizure to occur, the care provided is always the same.

Follow the Adult First Aid Procedure

Assess scene safety. If the scene is unsafe, do not approach it. Take Standard Precautions. Assess responsiveness. If the victim appears unconscious, tap them and ask loudly, "Are you okay?" Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit, naloxone, and an AED. Assess the person's breathing for no more than 10 seconds.

If an unresponsive person having a seizure is not breathing normally or only gasping, immediately start CPR.

If a person having a seizure is breathing, loosen tight clothes around neck and put something small and soft under the head. Do not put any objects in the person's mouth, including your fingers. It's physically impossible for someone to swallow their tongue.

Protect the person from injury during the seizure. Move objects away that they may bump in to. Do not restrain them. Time the length of seizure. Remain calm. Most seizures last only a short time and stop without any special treatment. Place the person in the recovery position and stay with them until they are awake and alert after the seizure.

Call 911 to activate EMS using a mobile device and/or activate your EAP if the person:

- Has a seizure lasting longer than 5 minutes,
- Is not breathing normally or only gasping,
- Has difficulty breathing,
- Is injured, pregnant, or sick,
- Has repeated seizures, or
- Has never had a seizure.

Safety & Health Tip

Traumatic brain injuries are a frequent cause of epilepsy. To help prevent traumatic brain injuries, use a vehicle seat belt whenever possible, and a helmet when using a bicycle, motorcycle, or similar vehicles. Be very careful when walking on slippery surfaces. Falls are the leading cause of brain injury.[62]

61 Types of Seizures. Available: https://www.epilepsy.com/learn/types-seizures [Retrieved 12/9/21]

62 Preventing Epilepsy. Available: https://www.cdc.gov/epilepsy/preventing-epilepsy.htm [Retrieved 09.07.21]

DIABETES & HYPOGLYCEMIA

Diabetes is a disease in which the body cannot effectively use sugar for energy. Hypoglycemia, or low blood sugar, is a diabetic condition that can rapidly develop and become life-threatening.

Signs of dangerously low blood sugar include hunger, shakiness, dizziness, confusion, difficulty speaking, and feeling anxious or weak.

Follow the Adult First Aid Procedure

Assess scene safety. If the scene is unsafe, do not approach it. Take Standard Precautions. Assess responsiveness. Send someone to get the first aid kit, naloxone, and an AED. Assess the person's breathing for no more than 10 seconds.

If the person is breathing and responsive, obtain consent. If they can swallow without difficulty, encourage the person to swallow about 20 grams of oral glucose. Oral glucose is preferred and comes in different forms, including a dissolved solution, gel, spray, chewable tablets, or a wet paste. If not available, use something with dietary sugar instead, such as orange juice or jellybeans.

Insulin is not considered an emergency medication. It is never appropriate to administer insulin to a diabetic person in an emergency setting. Regularly reassess scene safety, responsiveness, breathing, and the effectiveness of first aid care provided.

Call 911 to activate EMS using a mobile device and/or activate your EAP if:

- The symptoms do not resolve within 10 minutes,
- The person gets worse,
- The person is not able to swallow, or
- The person becomes unresponsive.

Safety & Health Tip

Type 2 diabetes most often develops in people over age 45. Prediabetes is a serious health condition where blood sugar levels are higher than normal, but not high enough yet to be diagnosed as type 2 diabetes. You can get a simple blood sugar test to find out if you have prediabetes. If you have prediabetes, losing a small amount of weight if you're overweight and getting regular physical activity can lower your risk for developing type 2 diabetes.[63]

63 Prediabetes – Your Chance to Prevent Type 2 Diabetes. Available: https://www.cdc.gov/diabetes/basics/prediabetes.html [Retrieved 09.07.21]

PRESYNCOPE & SYNCOPE

Presyncope, or near fainting, is the medical term for the feeling of fainting but without an actual loss of consciousness. Presyncope can last from a few seconds to minutes. It is typically caused by an unexpected drop in blood pressure and blood flow to the brain. Common causes include a body's reaction to anxiety, fear, pain, or stress.

Syncope is the medical term for fainting, the temporary loss of consciousness due to the sudden decline of blood flow to the brain. Standing in place too long, or rapid changes in position, such as getting up quickly from a seated position, can also result in feeling faint. More serious causes that may not resolve quickly include medications or an underlying medical condition.

A person may complain of suddenly being lightheaded and weak. They may describe feeling warm or having blurry vision. You may notice changes in skin appearance and condition. Recognition of the signs and symptoms of presyncope combined with rapid first aid treatment may prevent syncope from occurring.

If a trained first aid provider recognizes the signs or symptoms of presyncope, the priority is to help prevent injury to the person from falling. Quickly help them get into a safe position, such as squatting, sitting, or lying down. Once in a safe position, encourage the person to perform physical counterpressure maneuvers (PCMs).

PCMs are movements of a muscle or group of muscles that increase blood pressure. PCMs can relieve the symptoms of presyncope and prevent syncope.

Lower body PCMs are preferable to upper body ones because they are more effective at increasing blood pressure. The use of both lower and upper body PCMs at the same time can be beneficial. PCMs are reliable, safe, and effective. If you suspect presyncope, instruct the person in these movements. The use of PCMs should rapidly resolve signs and symptoms of presyncope. PCMs can also be used for self-care if you feel faint.

Call 911 to activate EMS using a mobile device and/or activate your EAP if the person's symptoms:

- Do not improve within 1 to 2 minutes,
- Worsen, or
- Reoccur.

PCMs should not be used if more serious warning signs and symptoms are present such as confusion, chest pain or discomfort,

accompanying injury, bleeding, signs of stroke, or breathing difficulty.

When responding to a person who fainted:

Follow the Adult First Aid Procedure

Assess scene safety. If the scene is unsafe, do not approach it. Take Standard Precautions. Assess responsiveness. If the victim appears unconscious, tap them and ask loudly, "Are you okay?" Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit, naloxone, and an AED. Assess the person's breathing for no more than 10 seconds. If an unresponsive person is breathing normally, place them on their side in the recovery position to help protect the airway.

After fainting, a person should quickly regain consciousness. If the person is responsive and breathing normally, and there is no evidence of pain or injury, have them flat on their back. Consider raising their feet about 6 to 12 inches.

Consider performing a secondary assessment while awaiting EMS.

Regularly reassess scene safety, responsiveness, breathing, and the effectiveness of first aid care provided. Stay with the person until someone with more advanced training takes over or EMS arrives.

Safety & Health Tip

Injuries due to syncope are frequent. The risk of major injuries is substantial. Older persons are at higher risk.[64]

64 Jorge JG, Raj SR, Teixeira PS, Teixeira JAC, Sheldon RS. Likelihood of injury due to vasovagal syncope: a systematic review and meta-analysis. *Europace*. 2021 Jul 18;23(7):1092-1099. doi: 10.1093/europace/euab041. PMID: 33693816. [Retrieved 9.9.21]

ENVIRONMENTAL EMERGENCIES

HEAT EMERGENCIES

An environment of high heat and humidity can cause heat cramps, exertional dehydration, heat exhaustion, and heat stroke.

Heat Cramps

Heat cramps are the earliest sign of heat illness. Heat cramps may also be a symptom of heat exhaustion.[65] Heat cramps are hard, tense, and painful muscle spasms of the hands, calves, feet, thighs, or arms. Early and appropriate first aid includes rest, moving to a cooler location, removing excess clothing (including PPE), and drinking a carbohydrate-electrolyte drink, such as Gatorade® or Pedialyte® or water if that is not available. Stretching, icing, and massaging the muscles often provides relief of pain.

Exertional Dehydration

Exertional dehydration occurs when a person loses more fluids than they take in and the body does not have enough fluids to work properly. In adults, the symptoms of exertional dehydration include feeling very thirsty, dry mouth, urinating and sweating less than usual, dark-colored urine, dry skin, feeling tired, and dizziness. If the trained first aid provider suspects a responsive person is dehydrated due to a hot environment, encourage the person to rehydrate by drinking a carbohydrate-electrolyte drink, or water if that is not available. Dehydration can be mild, or it can be severe enough to be life-threatening. If the person has an altered mental status or loss of consciousness, follow the adult first aid procedure. Immediately provide appropriate first aid.

65 Extreme Heat. Available: https://www.cdc.gov/disasters/extremeheat/faq.html [Retrieved 12/9/21]

Heat Exhaustion

Heat exhaustion can occur as a combined result of a rising internal temperature and dehydration. Symptoms include nausea, dizziness, muscle cramps, presyncope, headache, fatigue, and heavy sweating. Heat exhaustion is a serious condition because without early recognition and treatment, it can quickly progress to heat stroke, a life-threatening condition. Have the person stop any activity and move to a cooler place, preferably an air-conditioned environment. Loosen or remove excess clothing, including occupational PPE. Have the person lie down. Spray water on or apply cool, wet cloths to the head and torso. Use a fan to increase the cooling effect. If the person can follow simple commands and swallow without trouble, encourage them to drink a carbohydrate-electrolyte drink, or water if that is not available. In most cases, the person's condition will gradually get better. If the person does not improve or seems to get worse, follow the adult first aid procedure. Immediately provide appropriate first aid.

Safety & Health Tip

For those exposed to high temperatures, preventing heat-related emergencies can be achieved with three very simple actions early on: water, rest, and shade.

Heat Stroke

Heat stroke is a life-threatening medical emergency with a fatality rate of up to 71%.[66] Heat stroke includes all the signs and symptoms of heat exhaustion plus confusion, syncope, and seizures.

Follow the Adult First Aid Procedure

Assess scene safety. If the scene is unsafe, do not approach it. Take Standard Precautions. Assess responsiveness. If the victim appears unconscious, tap them and ask loudly, "Are you okay?" Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess the person's breathing for no more than 10 seconds.

If a person with suspected heat stroke is unresponsive, not breathing normally or only gasping, immediately start CPR.

If a person with suspected heat stroke is unresponsive, and breathing normally, the most important action a first aid provider can take is to begin immediate cooling with the resources available. It is critically important to bring the person's body temperature down as quickly as possible to reduce the risk of organ injury or death. [67]

When possible, begin immediate cooling by immersing the person up to the chin in cool to cold water.

If that is not possible or doing so would be unsafe, use other forms of immediate cooling. Apply cold packs to the neck, groin, and armpits. Spray or pour cold water on the person and fan them, or cover them with a cold, wet sheet and continue fanning. Provide continuous cooling until the person is alert and responsive or until someone with more advanced training, or EMS providers arrive and take over.

66 Jung YS, Kim HH, Yang HW, Choi S. Targeted temperature management in patients with severe heatstroke: Three case reports and treatment recommendations. Medicine (Baltimore). 2020 Nov 6;99(45):e23159..

67 Pellegrino JL, et al. 2020 American Heart Association and American Red Cross Focused Update for First Aid. *Circulation*. 2020 Oct 27;142(17)

COLD EMERGENCIES

A cold or cool, wet environment can result in a lowering of internal body temperature. Hypothermia and frostbite are the most dangerous cold-related conditions.

Frostnip

Frostnip is the freezing of superficial skin layers. The skin feels numb and looks white. Rewarm the area as soon as possible using skin-to-skin contact.

Frostbite

Frostbite occurs when deep tissues freeze. Body parts that are commonly exposed to extreme cold, such as the fingers, toes, earlobes, cheeks, and nose, are the most likely skin to be affected. Contact with metal accelerates freezing and is particularly dangerous.

Early signs of severe frostbite include burning, numbness, and tingling skin that appears white and frozen. Blisters may form. Do not rub frostbitten skin or apply snow or ice to it. Do not disturb blisters.

If you suspect frostbite, get the person to a warmer place. Remove any wet clothing from the affected area and dry the skin. Remove any constrictive jewelry. Do not rewarm the frozen body part if there is any chance it may freeze again. The thaw-refreeze cycle is very harmful. It is safer to keep the affected part frozen.

Place dry gauze pads between frostbitten fingers and toes. If gauze dressings are not available, use any clean material available such as clothing, a towel, or other materials to keep the body part still and protected.

If you are more than 2 hours from professional medical care, rapid rewarming is recommended. Immerse the frostbitten area in warm water for 20-30 minutes. The water should be 98.6 to 102.2° Fahrenheit or 37 to 39° Celsius.[68] If a thermometer is not available, test the water temperature by placing your hand in the water for at least 30 seconds to confirm that the temperature is tolerable.

Other heat sources such as chemical warmers, fire or heated rocks should not be used due to risk of further injury from thermal burns. Check continuously and keep the warm water at the recommended temperature. Severe pain, substantial swelling, blistering, and tissue color changes should be expected.

When rewarming is complete, use bulky, dry gauze dressings wrapped loosely on the thawed parts to protect them and allow for swelling. Elevate the affected body part if possible. Do not let the person use the affected body part after it is thawed. Have the person evaluated by a medical professional as soon as possible.

68 Wilderness Medical Society Clinical Practice Guidelines for the Prevention and Treatment of Frostbite: 2019 Update. Available: https://www.wemjournal.org/article/S1080-6032(19)30097-3/fulltext [Retrieved 12/9/21]

Hypothermia[69]

Hypothermia is an abnormally low core body temperature defined as 95 degrees Fahrenheit or 35 Celsius or less. Hypothermia frequently accompanies frostbite and can be fatal. Signs of hypothermia include shivering, an inability to function well, a decrease in consciousness, or an altered mental status. If there is any doubt, assume that the person is hypothermic.

Follow the Adult First Aid Procedure

Assess scene safety. If the scene is unsafe, do not approach it. Take Standard Precautions. Assess responsiveness. If the victim appears unconscious, tap them and ask loudly, "Are you okay?" Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess the person's breathing for no more than 10 seconds.

If a person with suspected hypothermia is unresponsive, not breathing normally or only gasping, start CPR. For adults and teens in cardiac arrest, untrained bystanders and persons not trained in CPR should perform compression-only CPR, with or without dispatcher assistance.

Cardiac arrest victims of hypothermia have survived with normal brain function after lengthy CPR efforts. However, do not start CPR if the person has obvious fatal injuries or if the chest is too stiff to compress.

If the person is breathing and responsive, but has an altered mental status, consent is implied. Keep a hypothermic person lying flat. Do not allow them to stand or walk. Handle them gently. Significant movement of the arms and legs can increase the flow of cool blood to the heart and increase the risk of cardiac arrest.

Protect the person from further cooling. Use blankets, quilts, sleeping bags, or any available insulating materials. Cover the head and neck to retain body heat. Gently move the person to a warmer place. Remove wet clothes, preferably by cutting them off to minimize movement. Dry the person gently and cover them with dry insulating materials.

If you are far from professional medical care, begin actively rewarming the person. Place warm (not hot) water bottles in the person's armpits. Apply a large electric heat pad or blankets to the chest and back. Avoid applying external heat to the arms and legs.

Visually inspect the persons heated skin every 20-30 minutes for excessive reddening or other signs of impending thermal burns. If signs of burns appear, stop active rewarming in the affected area. Stay with the person until someone with more advanced training takes over or EMS arrives.

Safety & Health Tip

To prevent frostbite injuries, use gloves to handle all equipment; never use bare hands. Metal accelerates freezing.

69 Dow J. et al. Wilderness Medical Society Clinical Practice Guidelines for the Out-of-Hospital Evaluation and Treatment of Accidental Hypothermia: 2019 Update. Wilderness Environ Med. 2019 Dec;30(4S):S47-S69. doi: 10.1016/j.wem.2019.10.002. 9.

BITES & STINGS

Stinging Insects

Many insects such as bees, wasps, and fire ants may sting when agitated or in defense of their nests or territories. While wasps and fire ants can sting repeatedly, the stinger of a honeybee detaches from its body, remains embedded in the skin, and continues to inject venom. If a stinger is present in the skin, remove it as quickly as possible. There is no need to find and use a dull-edged scraping device, such as a credit card.[70] Local pain, redness, swelling, and itching generally occur at the sting site.

Care for bites and stings by washing the site with soap and water. As a precaution for swelling, always remove jewelry from the affected area. Cover the area with an adhesive bandage or a pad.

Place a bag of ice and water wrapped in a towel over the area for up to 20 minutes to help reduce swelling and pain.

It is possible for a life-threatening allergic reaction to develop. Wheezing may be heard. Swelling of the lips, eyelids, and face may occur. Itchy red raised lumps, or hives, can appear on the face and chest.

Follow the Adult First Aid Procedure

Assess scene safety. If the scene is unsafe, do not approach it. Take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess the person's breathing for no more than 10 seconds.

A person with a history of allergic reactions to insect stings may carry an epinephrine autoinjector prescribed to them. If a person is unable to self-administer an injection, the first aid provider may be able to do it for them. Follow the steps for using an epinephrine autoinjector covered in the severe allergic reaction topic.

70 Lee JA, Singletary E, Charlton N. Methods of Honey Bee Stinger Removal: A Systematic Review of the Literature. Cureus. 2020 May 12;12(5):e8078. doi: 10.7759/cureus.8078.

Venomous Snakebite[71],[72]

Only a few types of venomous snakes are found in North America: rattlesnakes, copperheads, cottonmouths, and coral snakes. Cottonmouths, copperheads, and rattlesnakes are known as pit vipers. Pit vipers strike once and leave a characteristic bite with a single or double fang mark. A coral snake bite differs from that of a pit viper. Instead of a single strike, coral snakes chew with fixed fangs. Unlike pit vipers, coral snakes are reclusive and retreat from humans.

Bites usually result from intentional handling. Very few snake bites are fatal.[73] The main consequence of a venomous snake bite is damage to tissue at the injury site. Serious damage and death are preventable with antivenom, which is the definitive treatment for venomous snakebites.

Signs and symptoms of a pit viper bite include bite-site puncture marks; significant and spreading bite-site redness, swelling, and tenderness; bite-site pain, numbness, and bruising; fear and anxiety; and nausea and vomiting.

For a coral snake bite, pain and swelling at the bite site may be minimal or absent. Serious effects are often delayed, up to 13 hours. When they do appear, symptoms can include nausea, vomiting, abnormal sensations, slurred speech, double vision, muscle twitching, weakness, and paralysis.

Coral snakes possess a neurotoxic venom that causes respiratory failure and paralysis if not treated.

Follow the Adult First Aid Procedure

Assess scene safety. If the scene is unsafe, do not approach it. The priority after a snakebite is to avoid another bite, either to the victim or to the first aid provider. Stay away from the snake. Do not try to kill or capture it. If possible, take a digital photograph of the snake from a safe distance for later identification.

Take Standard Precautions. Assess responsiveness. Call 911 to activate EMS using a mobile device and/or activate your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Assess the person's breathing for no more than 10 seconds. If the person is breathing and responsive, obtain consent.

Calm the person. Let them know that fatalities are extremely rare and serious aftereffects are preventable. Anticipate swelling. Remove jewelry or constrictive clothing near the bite. Mark the leading edge of swelling on the skin and write the time alongside it. Flush the skin surface with warm or room temperature water with or without soap. Control bleeding with direct manual pressure.

If there are no known allergies, apply antibiotic ointment or cream and a clean, occlusive dressing. Keep the affected area at the level of the heart to reduce swelling and the spread of venom. Keep the person quiet and still. Stay with them until someone with more advanced training takes over or EMS arrives.

Do not apply a tourniquet, suck out the venom by mouth or mechanical means, cut or "bleed" the bite site, or apply ice or cold to the bite site bandage. These measures are of no benefit or are potentially harmful.

Safety & Health Tip

Practice caution in snake-prone environments. Wear protective clothing and use a stick to scare away snakes hiding in tall grass. Never touch or handle a snake.

71 Kanaan NC et al. Wilderness Medical Society Practice Guidelines for the Treatment of Pitviper Envenomations in the United States and Canada. Wilderness Environ Med. 2015 Dec;26(4):472-87. doi: 10.1016/j.wem.2015.05.007.

72 Coral Snake Bite Treatment. Available : https://www.poison.org/articles/coral-snake-bite-treatment-203 [Retrieved 6/18/21

73 Gummin, D. et al. 2019 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 37th Annual Report, Clinical Toxicology, 58:12, 1360-1541, DOI: 10.1080/15563650.2020.1834219

Venomous Spider Bites & Scorpion Stings

Spiders typically inhabit out of the way places such as wood piles or outbuildings. Most spider bites are harmless and require no specific treatment.

There are certain spiders that can be dangerous to humans. In the United States, these include the black widow and the brown recluse. Bites from these spiders are rare.[74] The main consequence of a venomous spider bite is damage to tissue at the injury site. Initially, venomous spider bites are often difficult to identify. Small puncture marks and bleeding may be seen. Tenderness, swelling, pain, itchiness, and redness at the bite site can develop. Over time, cramping abdominal pain and muscular rigidity in the body may occur. A person may experience headache, difficulty breathing, fever, chills, weakness, nausea, and vomiting.

In the United States, scorpions mainly live in dry, desert-type environments of the south and southwest. Death from a scorpion sting is very rare and has not been reported in the US for almost 50 years.[75]

Scorpions inflict severely painful stings. The pain occurs immediately and is often described as stinging or burning, although sometimes a tingling or numb sensation happens. Other possible effects at the sting site include redness, swelling, and a scab. The Arizona bark scorpion can sometimes cause abnormal muscle activity like muscle twitching, unusual eye movements, slurred speech, or difficulty swallowing and breathing.

Appropriate first aid for spider bites and scorpion stings is the same. Anticipate swelling. Remove jewelry or constrictive clothing near the bite. Wash the area well with soap and water. Apply a bag of ice and water wrapped in a towel to reduce pain and swelling, then call Poison Control Help at 1-800-222-1222. If the person develops signs and symptoms affecting the whole body, becomes unresponsive, or has a seizure, follow the adult first aid procedure.

Tick Bites

Ticks are blood-feeding parasites that are typically found in tall grass and shrubs. When a tick bites, it attaches itself firmly to the skin. The biggest concern with tick bites is the exposure and transmission of infectious disease, including Lyme disease. The entire tick should be removed as soon as possible. The longer a tick is attached, the more likely diseases or problems will occur.

To remove a tick, grasp it close to the skin with fine-tipped tweezers or a tick removal tool. Pull straight up with a steady, slow motion. Twisting or jerking can cause the mouth of the tick to break off. Clean the bite site well with soap and water or an antiseptic wipe. When finished, thoroughly wash your hands. If portions of the tick remain in the skin or the person develops a fever, rash, or aches within a few weeks of a tick bite, see a healthcare provider as soon as possible.

Do not use fingernail polish, petroleum jelly, a glowing hot match, or alcohol to remove a tick. These actions have no proven value and may cause harm.

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74 Gummin, D. et al. 2019 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 37th Annual Report, Clinical Toxicology, 58:12, 1360-1541, DOI: 10.1080/15563650.2020.1834219

75 Tarantula Bites and Scorpion Stings. Available: https://www.poison.org/articles/tarantula-scorpion-bite-sting-treatment-181 [Retrieved 6/18/21]

Marine Animal Stings

Stings from marine animals, such as fire coral, sea anemones, and jellyfish, can occur when a person is in or around the ocean environment. Stings can result in significant pain at the sting site and a raised, red, itchy rash. Quickly wipe off stingers or tentacles with a gloved hand or towel.

Stingray Stings

A stingray is a marine animal with a slender tail and venom-filled spines that can puncture the skin and inject venom. Stingray injuries result in thousands of emergency department visits annually.[76]

Signs and symptoms of a stingray injury include immediate, severe pain at the sting site with a bleeding, often discolored wound. Some swelling may be present.

Control bleeding with direct manual pressure. Wash the area well with soap and water. To control pain and inactivate the venom, immerse the injured area in water as hot as the person can tolerate for at least 30 minutes or as long as the pain persists. Medical evaluation and treatment are necessary if the spine is embedded in the wound, if the puncture is deep, or if it involves the person's chest, abdomen, or neck.

Severe reactions to marine animal stings can include difficulty breathing, heart palpitations, weakness, and syncope. If the person develops signs and symptoms of a severe allergic reaction or becomes unresponsive, follow the adult first aid procedure.

Animal and Human Bites

Human and animal bite wounds that break the skin can be very serious. They are frequently contaminated with bacteria. There is a high risk of infection. Bites from animals such as raccoons, skunks, bats, and foxes can also cause rabies. Left untreated, rabies is fatal.

Pain, puncture wounds, bleeding, bruising, numbness, and tingling can occur with any bite. Control bleeding with direct manual pressure. Wash the area well with soap and water for 3 to 5 minutes. [77] Place a bag of ice and water wrapped in a towel over the area for up to 20 minutes to help reduce swelling and pain.

If there are no known allergies to it, apply an antibiotic ointment or cream and a clean, occlusive dressing. Medical evaluation as soon as possible and within 24 hours is necessary for all bites that break the skin.

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76 Myatt T, Nguyen BJ, Clark RF, Coffey CH, O'Connell CW. A Prospective Study of Stingray Injury and Envenomation Outcomes. J Emerg Med. 2018 Aug;55(2):213-217. doi: 10.1016/j.jemermed.2018.04.035.

77 Human bites. Available: https://medlineplus.gov/ency/patientinstructions/000736.htm [Retrieved 12/9/2021]

section three

CHILD CPR AED

In this training, a child is defined as 1 year of age until the onset of puberty. Puberty can be identified by breast development in females and the presence of armpit hair in males. For those with signs of puberty, provide adult CPR.

CHILD – CARDIAC ARREST & PEDIATRIC CHAIN OF SURVIVAL

In cardiac arrest, the child's heart stops beating. Fortunately, most children have healthy hearts and cardiac arrest in children is rare. When it does happen, it is most commonly a result of asphyxia, a lack of oxygen that occurs when breathing slows or stops. The lack of oxygen causes the heart to stop within minutes. This is also known as secondary cardiac arrest because the heart stops secondary to a lack of oxygen and not from a problem with the heart itself. Causes of secondary cardiac arrest include airway obstruction, lung infections or diseases, drowning, choking, and shock resulting from injuries such as motor vehicle accidents, burns, falls, and child abuse.

Prevention

Prevention is critical in reducing pediatric cardiac arrest from asphyxia. Prevention includes preventing drowning and choking as well as ensuring the use of essential safety equipment such as child passenger safety seats and bicycle helmets, along with proper adult supervision.

Sudden Cardiac Arrest

Sudden cardiac arrest occurs when the normal electrical impulses in the heart cause it to beat too quickly, inefficiently, or in an unsynchronized manner. When the lower chambers of the heart beat too quickly or quiver, the heart cannot pump blood. These abnormal heart rhythms are known as pulseless ventricular tachycardia and ventricular fibrillation. Blood flow to the body, along with the oxygen it carries, abruptly stops. Within minutes, brain cell death starts to occur from the lack of oxygen. Sudden cardiac arrest is also known as primary cardiac arrest because it is a problem with the heart itself.

While uncommon, sudden cardiac arrest can and does occur in children of all ages. A victim of SCA may suddenly collapse. Occasionally, SCA victims will experience 10-20 seconds of seizure activity when the brain stops receiving oxygen. Normal breathing stops. Abnormal gasping may last for several minutes. If not treated immediately, SCA results in death.

CPR and Defibrillation

CPR is the immediate treatment for suspected SCA. CPR can restore limited oxygen to the brain and other vital organs through a combination of chest compressions, an open airway, and rescue breaths. However, CPR alone is not enough.

The most effective way to end pulseless ventricular tachycardia and ventricular fibrillation is defibrillation, using an automated external defibrillator (AED) with electrode pads adhered to the chest. An electrical shock passed through the chest may restore the heart's normal contractions. Immediate, high-quality CPR and early defibrillation with an AED can more than double the likelihood for survival.

Pediatric Chain of Survival

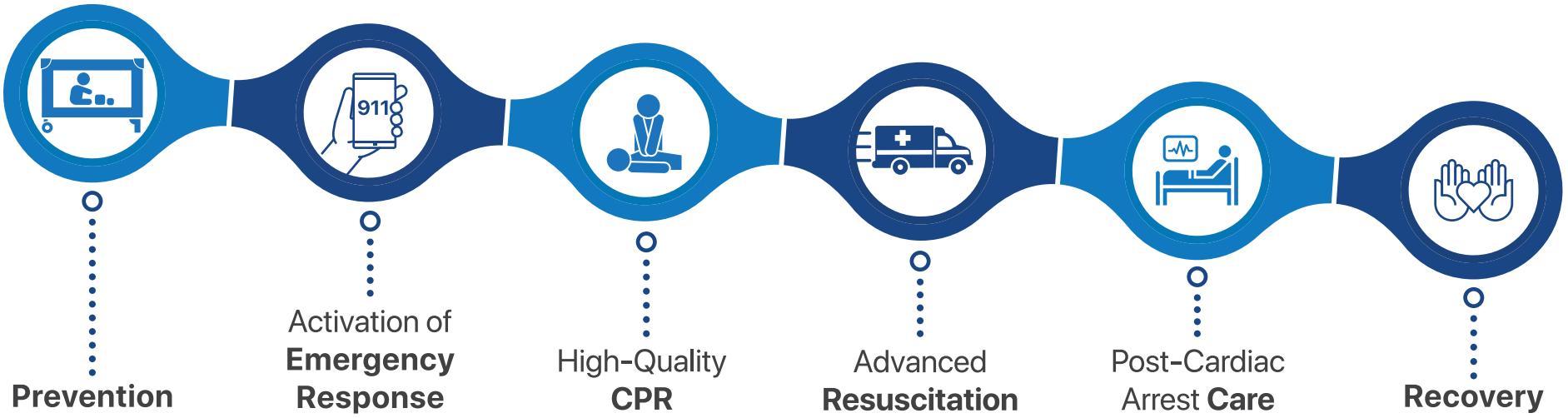
The pediatric chain of survival consists of a series of six interdependent links that describe the best approach to cardiac arrest care. The chain of survival consists of:

- Prevention of cardiac arrest,
- Prompt activation of EMS,
- Immediate high-quality CPR and defibrillation,
- Advanced resuscitation,
- Effective post-cardiac arrest care at a hospital, and
- Recovery.

The greatest chance for survival exists when all the links of the chain of survival are strong.

Safety equipment, supervision, and other strategies can help to prevent pediatric cardiac arrest. Early activation of EMS or an emergency action plan gets help coming right away. Immediate high-quality CPR improves the child's chance of survival by providing oxygen to the heart and brain. Effective advanced life support treatment, with a focus on return of spontaneous circulation (ROSC) and transport to a hospital for all persons with a chance of survival, supports the most favorable outcome. Effective post-cardiac care, including monitoring and the use of medication, helps improve the likelihood of long-term survival. Recovery supports the child's physical and emotional needs that are ongoing after hospital discharge.

Each link in the chain is essential for the most positive outcome. If a single link is missing, the chances for survival are greatly reduced.



CHILD – ASSESSMENT & CHEST COMPRESSIONS

Assessment of the scene and the child is a critical skill that applies in any emergency. The steps of assessment are crucial in determining the provider's next actions.

As a single CPR provider, follow the CPR AED procedure:

Assess Scene Safety

- First, assess scene safety. Before anything else, pause to make sure the scene is safe for you and the child.
- Take Standard Precautions.

Assess Responsiveness

- If the scene is safe, assess responsiveness. Tap the child and ask loudly, "Are you okay?"

Activate EMS and/or EAP

- If the child is unresponsive, call 911 to activate EMS using a mobile device and/or activate your EAP.

Send Someone to Get the First Aid Kit and an AED

- After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED.

Assess Breathing

- Assess the child's breathing for no more than 10 seconds. Look at the child's chest and face for signs of normal breathing.
  - Look for the chest to rise and fall.
  - Weak, irregular gasping, snorting, snoring, or gurgling is not normal breathing.
- Then, take action based the presence or absence of normal breathing.

Unresponsive, Not Breathing Normally

- If an unresponsive child is not breathing normally or not breathing at all, or is only gasping, immediately start CPR, beginning with chest compressions.
- If you are alone without a mobile device, give 2 minutes of CPR before leaving the child, or carrying them with you, to get an AED and activate EMS and/or your EAP if you have not done so already.

Child Chest Compressions

High-quality chest compressions are the foundation of high-quality CPR for children. To deliver child chest compressions, position the child face up on a firm flat surface. If the child is face down, carefully roll them over.

CPR Provider Position

Position yourself at the child's side, kneeling close to one side of the chest.

Place 1 or 2 hands on the center of the chest. For a small child, 1 hand may be enough. Position your shoulders directly above your hands and straighten your arms to lock your elbows.

Push Hard and Deep.

Whether you use 1 or 2 hands, push hard, straight down, using your upper body weight to compress the chest at least 2 inches (5 centimeters).

Allow Complete Chest Recoil

At the end of each compression, lift all your weight off the child's chest, allowing it to completely recoil, or rebound, to its normal position without losing contact with the chest. Complete chest recoil allows the heart to refill. Avoid leaning on the chest between compressions.

Push Fast

Compress the chest at a rate of 100-120 compressions per minute. Minimize interruption in chest compressions. Perform 30 high-quality chest compressions. Count out loud.

Use a CPR Feedback Device

A CPR feedback device transmits information on compression rate, depth, and recoil. Providers can significantly improve chest compression quality by adjusting technique based on data from a feedback device. Using a CPR feedback device is shown to improve outcomes and is recommended during CPR training and in real life resuscitation attempts.

CHILD – RESCUE BREATHING & USING A CPR MASK

Rescue breathing is artificial ventilation of the lungs. It provides oxygenation of the blood and removal of carbon dioxide. CPR providers can give rescue breathing using their own exhaled breath and a CPR mask. Room air contains about 21% oxygen. Exhaled air contains between 16% and 17% oxygen. This exhaled oxygen is enough to support life.

Importance of Child Rescue Breaths

Rescue breaths are extremely important for children because cardiac arrest typically results from asphyxia. Conventional CPR with rescue breathing should be performed by all trained CPR providers who are willing and able.

Take Standard Precautions

Take Standard Precautions when providing child rescue breaths. Use an adult/child-sized CPR mask. Some CPR masks allow you to attach a high-efficiency particulate air (HEPA) filter to provide further protection during CPR. The HEPA filter fits between the valve and mask, in the path of the exhaled air. HEPA filters can trap airborne virus particles.

Open the Airway

To give rescue breaths, there must be an open airway. The airway is the only path for getting air into the lungs. The tongue is connected to the lower jaw. Lifting the jaw forward pulls the tongue away from the back of the throat, relieving the obstruction and opening the airway.

Head Tilt– Chin Lift

To open the airway with the head tilt–chin lift maneuver, position yourself at the person's side. Place one hand on their forehead. Place the fingertips of your other hand under the bony part of the lower jaw, near the chin. Apply firm, backward pressure on the forehead while lifting the chin upward. Avoid pressing into the soft tissue of the chin with your fingers, as this can also obstruct the airway. Leave the mouth slightly open.

Using a CPR Mask

To use an adult/child-sized CPR mask, position yourself at the person's side. Place the mask flat on the child's face with the top of the mask over the bridge of the nose. Use your thumb and forefinger to provide uniform pressure around the top of the mask. Use the thumb of your hand lifting the chin to control the bottom of the mask. Hook your fingertips of the hand controlling the bottom of the mask under the bony ridge of the jaw. Tilt the head and lift the chin to open the airway. Lift the child's face up into the mask to create an airtight seal. Give a rescue breath by blowing through the valve opening. Each breath is 1 second in length. **Give enough air to create a visible rise of the chest, but no more. Stop your rescue breath as soon as you see chest rise**.

> ***Too Many Breaths or a Large Volume Can Be Harmful.***
> *CPR providers should avoid giving too many breaths or a large volume during rescue breathing because it can be harmful. It can force air into the stomach, causing regurgitation of food, liquids, or vomit into the airway.*

CHILD – AUTOMATED EXTERNAL DEFIBRILLATION & USING AN AED

An automated external defibrillator (AED) is a portable computerized device that is simple to operate. It can identify the abnormal heart rhythms associated with sudden cardiac arrest – pulseless ventricular tachycardia and ventricular fibrillation – and deliver an electrical shock to restore the heart's normal contractions. If the electrical shock is effective, there will be a return of spontaneous circulation. The heart will be able to pump blood. The child may also start breathing, moving, or reacting in other ways.

AED design varies by model and manufacturer, but they all operate in a similar manner. If you have an AED in your workplace, be familiar with its operation. Most AEDs are designed for both adult and pediatric use. The energy level of the shock for pediatric use is reduced from the standard adult energy setting. The shock is reduced by an electronic device built into the AED and activated using a button, "key," or another type of switching mechanism.

Choosing the AED Pads

Pediatric pads are recommended for children under 8 years of age. If the child pads are not available, use the adult pads. The standard adult shock will be higher, but a higher energy shock is better than no shock at all.

Children 8 Years of Age and Older

Do not apply pediatric pads to children 8 years of age and older because the energy level of the shock will be too low.

Power on the AED

- Power on the AED and bare the child's chest. If there is a button, "key," or another type of mechanism for switching to child use, activate it.

Bare the Chest

- Proper AED operation requires direct contact between the pads and the child's skin. Any clothing in the way must be removed. If necessary, cut through clothing with the shears that are typically included with a CPR AED response kit.

Apply the AED Pads

- Peel the pads from the backing sheet one at a time and place each according to the pictures. Some pads require a front-and-back position. Others require a left-right position. Press the pads firmly in place. Pads must not touch or overlap each other. Avoid placing the pads over medication patches or implanted devices. Try to apply the pads within 30 seconds after the AED arrives. If possible, compressions should continue while the pads are being placed.

Allow AED Analysis

- When the AED voice prompts you, clear the child and allow the AED to analyze the heart rhythm. Be certain that no one is touching the person.

Clear the Person and Deliver a Shock

- If the AED advises a shock, it will prompt you to clear the person again. Loudly say, "Everybody clear," or something similar.
- For most AEDs, delivering a shock is done by pressing the shock button. Deliver a shock.
- Once a shock has been delivered, immediately resume CPR starting with chest compressions.

Follow the Voice Prompts

- After about 2 minutes of CPR, the AED will prompt you again to analyze the heart rhythm. Follow the voice prompts.

Continue CPR AED

- Continue CPR AED until another CPR provider, someone with more advanced training, or EMS providers arrive and take over, or until the child starts breathing, moving, or reacting in other ways.

Reassess Regularly

- If the child begins responding, regularly reassess their responsiveness, airway, and breathing.

CHILD – ONE-PROVIDER CPR AED

One pediatric CPR provider can provide high-quality child CPR by putting together all the skills of assessment, compressions, airway, breathing, and AED use.

Perform an Assessment

- First, assess scene safety, taking Standard Precautions. If the scene is safe, assess the child's responsiveness. Tap the child and ask loudly, "Are you okay?"
- If the child is unresponsive, call 911 to activate EMS using a mobile device and/or activate your EAP.
- After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED.

- Assess the child's breathing normally for no more than 10 seconds. If an unresponsive child is not breathing normally or not breathing at all, or is only gasping, immediately start high-quality CPR, beginning with chest compressions.

Perform High-Quality Chest Compressions

- Position the child on a firm, flat surface. Perform 30 high-quality chest compressions. Position 1 or 2 hands on the lower half of the breastbone. Use upper body weight to compress. Compress at least 2 inches (5 centimeters). Compress at a rate of 100–120 times per minute. Allow the chest to fully recoil at the top of each compression.

Give Rescue Breaths

- Use a CPR mask to give rescue breaths. Open the airway and give 2 rescue breaths. Ensure each breath is 1 second in length and creates visible rise of the chest.

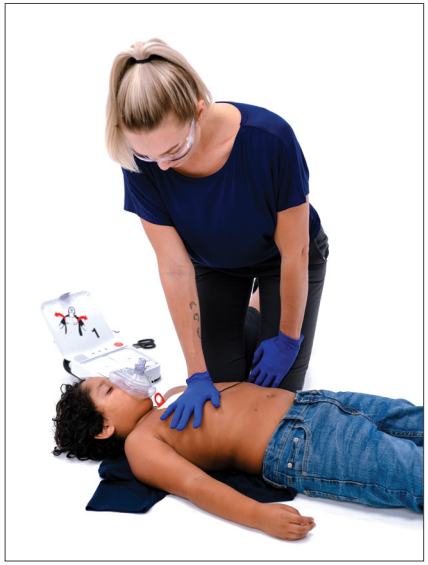
Continue CPR

- Immediately resume high-quality chest compressions.
- Repeat CPR cycles of 30 compressions and 2 breaths for 2 minutes.
- If you are alone without a mobile device, give 2 minutes of CPR before leaving the child, or carrying them with you, to get an AED and activate EMS or your EAP – if you have not done so already.

Operate the AED

- As soon as an AED is available, power on the AED. Bare the chest. If there is a button, "key," or another type of mechanism for switching to child use, activate it.
- Use pediatric pads for children below 8 years of age. Correctly apply the AED pads according to the pictures. If the child pads are not available, use the adult pads.
- Clear the child so the AED can analyze the heart rhythm. While the AED is analyzing, make sure no one is touching the person.
- If directed by the AED to deliver a shock, clear the person again and press the shock button.

Resume High-Quality CPR



- Immediately resume CPR starting with chest compressions.
- After about 2 minutes of CPR, the AED will prompt you again to analyze the heart rhythm. Follow the voice prompts.

Continue CPR AED

- Continue CPR AED until another CPR provider, someone with more advanced training, or EMS providers arrive and take over, or until the child starts breathing, moving, or reacting in other ways.
- If another CPR provider is available, take turns providing compressions. Switch providers about every 2 minutes, sooner if they get tired. Try to minimize interruptions to compressions to less than 10 seconds.

Safety & Health Tip

Commotio cordis is caused by a blow to the chest over the region of the heart by a blunt object (like a baseball, hockey puck, or fist) that does not penetrate the body and usually results in ventricular fibrillation leading to sudden cardiac death if treatment by defibrillation is not immediately given.[78] Research has shown that some chest protectors may reduce the incidence of commotio cordis.[79]

78 "Commotio cordis." Merriam-Webster.com Medical Dictionary, Merriam-Webster, https://www.merriam-webster.com/medical/commotio%20cordis. Accessed 21 Sep. 2021.

79 Kumar K, Mandleywala SN, Gannon MP, Estes NA 3rd, Weinstock J, Link MS. Development of a Chest Wall Protector Effective in Preventing Sudden Cardiac Death by Chest Wall Impact (Commotio Cordis). Clin J Sport Med. 2017 Jan;27(1):26-30. doi: 10.1097/JSM.0000000000000297. PMID: 27014942; PMCID: PMC5181132.

CHILD – ADDITIONAL CPR AED CONSIDERATIONS

A CPR provider may face some circumstances that require additional considerations or tasks for effective care. Act quickly if anything affects AED use to keep this link in the chain strong.

In Water

Do not use an AED if the child is immersed in water. The child must be removed from water before using an AED.

Wet Setting

If the child is in a wet setting, such as lying on snow or ice, in rain, on a wet floor or deck, or in a small puddle, it is safe to use the AED. If the child's chest is wet, quickly dry it before applying pads.

On Metal

AEDs can be used safely on metal surfaces, such as gratings or stairwells. Make sure the pads do not directly touch any metal surface when the AED is powered on.

Jewelry

If the AED pads are not in contact with metal jewelry, the jewelry does not have to be removed.

Take Standard Precautions

Resuscitation efforts put CPR providers at an increased risk of exposure and infection from bloodborne and airborne pathogens. CPR providers should routinely take Standard Precautions during resuscitation, including using a CPR mask with a HEPA filter when available.

- ***Mouth-to-Mouth Rescue Breathing.*** There may be a rare or extraordinary circumstance when a barrier device is not available, and a CPR provider is willing to provide mouth-to-mouth rescue breathing. Mouth-to-mouth rescue breathing is a form of artificial ventilation that can provide oxygen to a respiratory or cardiac arrest victim. To give mouth-to-mouth rescue breathing to a child:
  - Open the airway with a head tilt–chin lift.
  - Pinch the nose closed with your thumb and forefinger.
  - Take a regular-sized breath and seal your lips around the child's mouth, creating an airtight seal.
  - Give 1 breath over 1 second. Give enough air to make the chest visibly rise, but no more than that.

CHILD – SUSPECTED OPIOID-ASSOCIATED EMERGENCY (OAE)

Prescription opioid misuse has become a leading cause of unintentional injury and death among adolescents and young adults in the United States.[80] Recognizing an opioid overdose can be difficult. Signs of an overdose may include:

- Small, constricted "pinpoint pupils,"
- Changes in skin appearance and condition,
- Falling asleep or loss of consciousness,
- Slow, shallow breathing,
- Choking or gurgling sounds, and
- Limp body.

Opioids can cause death by slowing, and eventually stopping, breathing. A quick response to an opioid overdose, including administering naloxone, can prevent brain injury and death. Naloxone is a medication approved by the U.S. Food and Drug Administration (FDA), designed to rapidly reverse opioid overdose. Naloxone is available without a prescription in all U.S. states, the District of Columbia and Puerto Rico. Narcan® Nasal Spray is the most commonly prescribed opioid reversal medication. Narcan® Nasal Spray is approved for the emergency treatment of known or suspected opioid overdose in adults and children of all ages.[81]

Using Narcan® Nasal Spray

To use Narcan® Nasal Spray, peel back the package to remove the device. Hold the device with your thumb on the bottom of the plunger and 2 fingers on the nozzle. Place and hold the tip of the nozzle in either nostril until your fingers touch the bottom of the person's nose. Press the plunger firmly to release the dose into the nose.

Child – Procedure for Suspected OAE

If you suspect an opioid-associated emergency, first assess scene safety. Take Standard Precautions. Avoid contact with drug residue, containers, needles, and other paraphernalia. Assess responsiveness. Tap the child and ask loudly, "Are you okay?" If the child is unresponsive, activate EMS and/or your EAP.

After activating, and unless they are readily available to you, send someone to get the first aid kit, naloxone, and an AED. Assess the child's breathing for no more than 10 seconds.

- If the unresponsive child is not breathing normally or only gasping, immediately start CPR, beginning with chest compressions.
- Use the AED as soon as one becomes available. Give naloxone as soon as you can, but do not delay CPR and AED use to give it.
- If the unresponsive child is breathing normally, give naloxone if available. To help protect the airway, place the child in the recovery position.

If the child does not respond, another dose may be given in the same way. Narcan® Nasal Spray may be dosed every 2 to 3 minutes, if available.

80 Hudgins JD, Porter JJ, Monuteaux MC, Bourgeois FT. Prescription opioid use and misuse among adolescents and young adults in the United States: A national survey study. PLoS Med. 2019 Nov 5;16(11):e1002922. doi: 10.1371/journal.pmed.1002922

81 Department of Health and Human Services Public Health Service Food and Drug Administration, February 12, 2019. Available: https://www.fda.gov/media/123725/download [Retrieved 7/16/21]

CHILD – RELIEF OF CHOKING

Choking, also known as foreign-body airway obstruction, can occur when a solid object, such as a piece of food or a small object, becomes stuck in the upper airway. The child cannot breathe.

A forceful thrust beneath the ribs and up into the diaphragm can pressurize the air in the chest and pop out the obstruction. Chest compressions can also create enough pressure to expel a foreign-body airway obstruction.

Mild Airway Obstruction

To provide the appropriate care, you must be able to recognize the difference between a mild and a severe airway obstruction. With a mild obstruction, the child can speak and cough. They may wheeze between coughs. A mild obstruction is typically cleared naturally through forceful coughing. If the child can inhale and exhale, encourage them to continue coughing. Watch for signs of the airway obstruction becoming severe.

Severe Airway Obstruction

When a severe airway obstruction occurs, the child cannot get air in or out of the lungs. This is a life-threatening medical emergency. If the foreign body is not removed, the child will quickly become unresponsive and suffer a secondary cardiac arrest within minutes.

Responsive Child

Signs of a severe airway obstruction include the inability to speak or cry, a weak cough, or no cough at all. The child may make a high-pitched noise when trying to inhale or make no sound at all. They may hold their hands to the throat.

Ask, “Are you choking?” If the child nods yes, or is unable to speak or cough, act quickly. If you are not alone, have someone call 911 to activate EMS using a mobile device and/or activate your EAP.

Position Yourself

- Stand behind the child. If needed, kneel behind a smaller child.
- Reach around and locate the navel. Make a fist with the other hand and place it thumb-side against the abdomen, just above the navel and below the ribs. Grasp your fist with the other hand.

Give Thrusts

- Quickly thrust inward and upward into the abdomen. Repeat. Each thrust needs to be given with the intent of dislodging and expelling the object.
- Continue until the child can breathe normally or becomes unresponsive.

If the object is expelled and there is a good air exchange, the child should be seen by a healthcare professional. Infrequent, but serious complications from abdominal thrusts can occur.

Large Child

If the child is very large and you cannot wrap your arms around them, use chest thrusts instead of abdominal thrusts.

- Position yourself directly behind the child.
- Reach under the armpits and place the thumb-side of your fist on the center of the chest.
- Grasp your fist with your other hand and thrust straight backward. Try to not put pressure on the ribs. Give each chest thrust forcefully with the intent of dislodging and expelling the object.
- Repeat the chest thrusts until the object is expelled and the child can breathe or becomes unresponsive.

If the Child Becomes Unresponsive

If the child becomes unresponsive, carefully lower them to the ground. Follow the CPR AED procedure. Call 911 to activate EMS using a mobile device or activate your EAP if you have not done so already. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Begin CPR starting with compressions. Before opening the airway to provide rescue breaths, open the child's mouth wide. Only if you see an object, remove it with your fingers. Do not stick your finger blindly in a child's throat and attempt to sweep out an object. This can cause injury or push the object further down the throat, worsening the obstruction.

If You Are Alone Without a Mobile Device

If you are alone without a mobile device, give 2 minutes of CPR before leaving a child, or carrying them with you, to get an AED and activate EMS or your EAP – if you have not done so already. Continue until another CPR provider, someone with more advanced training, or EMS providers arrive and take over, or until the person starts breathing, moving, or reacting in other ways.

section four

INFANT CPR AED

In this training, an infant is defined as younger than 1 year of age, excluding newly born infants.

INFANT – CARDIAC ARREST & PEDIATRIC CHAIN OF SURVIVAL

In cardiac arrest, the infant's heart stops beating. Fortunately, most infants have healthy hearts and cardiac arrest in infants is rare. When it does happen, it is most commonly a result of asphyxia, a lack of oxygen that occurs when breathing slows or stops. The lack of oxygen causes the heart to stop within minutes. This is also known as secondary cardiac arrest because the heart stops secondary to a lack of oxygen and not from a problem with the heart itself. Causes of secondary cardiac arrest include airway obstruction, lung infections or diseases, drowning, choking, and shock resulting from injuries such as motor vehicle accidents, burns, falls, and child abuse.

Prevention

Prevention is critical in reducing pediatric cardiac arrest from asphyxia. Prevention includes preventing drowning and choking as well as ensuring the use of essential safety equipment such as child passenger safety seats and bicycle helmets, along with proper adult supervision.

Sudden Cardiac Arrest

Sudden cardiac arrest occurs when the normal electrical impulses in the heart cause it to beat too quickly, inefficiently, or in an unsynchronized manner. When the lower chambers of the heart beat too quickly or quiver, the heart cannot pump blood. These abnormal heart rhythms are known as pulseless ventricular tachycardia and ventricular fibrillation. Blood flow to the body, along with the oxygen it carries, abruptly stops. Within minutes, brain cell death starts to occur from the lack of oxygen. Sudden cardiac arrest is also known as primary cardiac arrest because it is a problem with the heart itself.

While uncommon, sudden cardiac arrest can and does occur in children of all ages.

A victim of SCA may suddenly collapse. Occasionally, SCA victims will experience 10-20 seconds of seizure activity when the brain stops receiving oxygen. Normal breathing stops. Abnormal gasping may last for several minutes. If not treated immediately, SCA results in death.

CPR and Defibrillation

CPR is the immediate treatment for suspected SCA. CPR can restore limited oxygen to the brain and other vital organs through a combination of chest compressions, an open airway, and rescue breaths. However, CPR alone is not enough.

The most effective way to end pulseless ventricular tachycardia and ventricular fibrillation is defibrillation, using an automated external defibrillator (AED) with electrode pads adhered to the chest. An electrical shock passed through the chest may restore the heart's normal contractions. Immediate, high-quality CPR and early defibrillation with an AED can more than double the likelihood for survival.

Pediatric Chain of Survival

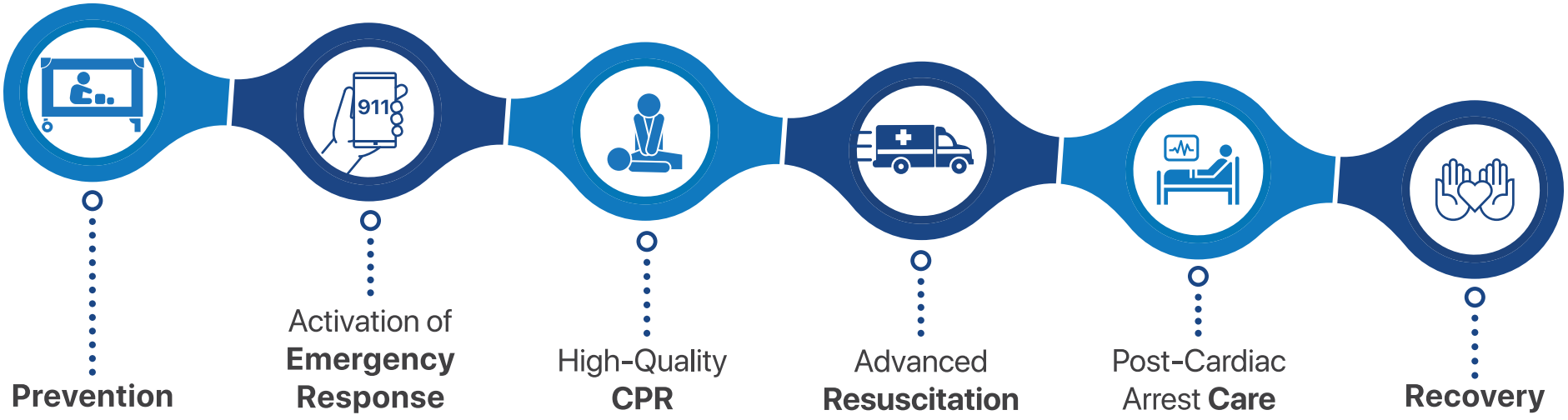
The pediatric chain of survival consists of a series of six interdependent links that describe the best approach to cardiac arrest care. The chain of survival consists of:

- Prevention of cardiac arrest,
- Prompt activation of EMS,
- Immediate high-quality CPR and defibrillation,
- Advanced resuscitation,
- Effective post-cardiac arrest care at a hospital, and
- Recovery.

The greatest chance for survival exists when all the links of the chain of survival are strong.

Safety equipment, supervision, and other strategies can help to prevent pediatric cardiac arrest. Early activation of EMS or an emergency action plan gets help coming right away. Immediate high-quality CPR improves the child's chance of survival by providing oxygen to the heart and brain. Effective advanced life support treatment, with a focus on return of spontaneous circulation (ROSC), and transport to a hospital for all persons with a chance of survival supports the most favorable outcome. Effective post-cardiac care, including monitoring and the use of medication, helps improve the likelihood of long-term survival. Recovery supports the child's physical and emotional needs that are ongoing after hospital discharge.

Each link in the chain is essential for the most positive outcome. If a single link is missing, the chances for survival are greatly reduced.



INFANT – ASSESSMENT & CHEST COMPRESSIONS

Assessment of the scene and the infant is a critical skill that applies in any emergency. The steps of assessment are crucial in determining the provider's next actions.

As a single CPR provider, follow the CPR AED procedure:

Assess Scene Safety

- First, assess scene safety. Before anything else, pause to make sure the scene is safe for you and the infant.
- Take Standard Precautions.

Assess Responsiveness

- If the scene is safe, assess responsiveness. Gently tap the infant and ask loudly, "Are you okay?"

Activate EMS and/or EAP

- If the infant is unresponsive, call 911 to activate EMS using a mobile device and/or activate your EAP.

Send Someone to Get the First Aid Kit and an AED

- After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED.

Assess Breathing

- Assess the infant's breathing for no more than 10 seconds.
  - Look for the chest to rise and fall.
  - Weak, irregular gasping, snorting, snoring, or gurgling is not normal breathing.
- Then, take action based the presence or absence of normal breathing.

Unresponsive, Not Breathing Normally

If the unresponsive infant is not breathing normally or only gasping, and you are alone, immediately start CPR, beginning with chest compressions. If you are alone without a mobile device, give 2 minutes of CPR. Then, bring the infant with you to get an AED and activate EMS or your EAP – if you have not done so already.

Infant Chest Compressions

High-quality chest compressions are the foundation of high-quality infant CPR. To deliver infant chest compressions, position the infant face up on a firm flat surface. If the infant is face down, carefully roll them over. For infant compressions, use one of three hand-position techniques: the 2-Finger, 2-Thumb Encircling-Hands, or the Heel of One Hand.

2-Finger Technique

- Place two fingertips in the center of the infant's chest, just below the nipple line, on the lower half of the breastbone. Do not press the tip of the breastbone. Use both fingers to compress the chest.

2-Thumb Encircling-Hands Technique

- Position yourself at the infant's side. Place the pads of both thumbs side-by-side in the center of the infant's chest, on the lower half of the breastbone. Your thumbs may overlap on very small infants. With the fingers of both hands, encircle the infant's chest and support the back. Use both thumbs to compress the chest.

Heel of One Hand Technique

- Place the heel of one hand on the center of the chest, on the lower half of the breastbone. Position your shoulder directly above your hand and straighten your arm to lock your elbow. Use the heel of one hand to compress the chest. This technique may be useful for larger infants or when the CPR provider has difficulty compressing the appropriate depth using fingers or thumbs.

Whichever technique you use, push hard, straight down, to compress the chest approximately 1 ½ inches (4 centimeters). This depth should be at least one-third of the diameter of the infant's chest. At the end of each compression, allow complete chest recoil. Compress the chest at a rate of 100-120 compressions per minute. Minimize interruptions.

INFANT – RESCUE BREATHING & USING A CPR MASK

Rescue breathing is artificial ventilation of the lungs. It provides oxygenation of the blood and removal of carbon dioxide. CPR providers can give rescue breathing using their own exhaled breath and a CPR mask. Room air contains about 21% oxygen. Exhaled air contains between 16% and 17% oxygen. This exhaled oxygen is enough to support life.

Importance of Infant Rescue Breaths

Rescue breaths are extremely important for infants because cardiac arrest typically results from asphyxia. Conventional CPR with rescue breathing should be performed by all trained CPR providers who are willing and able.

Take Standard Precautions

Take Standard Precautions when providing infant rescue breaths. Use an infant-sized CPR mask. Some CPR masks allow you to attach a high-efficiency particulate air (HEPA) filter to provide further protection during CPR. The HEPA filter fits between the valve and mask, in the path of the exhaled air. HEPA filters can trap airborne virus particles. Rescue breaths are extremely important for infants because cardiac arrest typically results from asphyxia.

Open the Airway

To give rescue breaths, there must be an open airway. The airway is the only path for getting air into the lungs. The tongue is connected to the lower jaw. Lifting the jaw forward pulls the tongue away from the back of the throat, relieving the obstruction and opening the airway.

Head Tilt–Chin Lift

To open the airway with the head tilt–chin lift maneuver, position yourself at the infant's side.

Place one hand on their forehead. Place the fingertips of your other hand under the bony part of the lower jaw, near the chin. Apply firm, backward pressure on the forehead while lifting the chin upward. Avoid pressing into the soft tissue of the chin with your fingers, as this can also obstruct the airway. Leave the mouth slightly open. Keep an infant's head in a neutral "sniffing" position. Tilting the head beyond a neutral position may block the airway.

Using a CPR Mask

To use an infant-sized CPR mask, position yourself at the infant's side. Place the mask flat on the infant's face with the top of the mask over the bridge of the nose. Use your thumb and forefinger to provide uniform pressure around the top of the mask. Use the thumb of your hand lifting the chin to control the bottom of the mask. Hook your fingertips of the hand controlling the bottom of mask under the bony ridge of the jaw. Open the airway with the head tilt–chin lift maneuver. Tilt the head and lift the chin to open the airway. Maintain a neutral "sniffing" position. Lift the infant's face up into the mask to create an airtight seal. Give a rescue breath by blowing through the valve opening. Each breath is 1 second in length. **Give enough air to create a visible rise of the chest, but no more. Stop your rescue breath as soon as you see chest rise.**

> ***Too Many Breaths or A Large Volume Can Be Harmful.***
> *CPR providers should avoid giving too many breaths or a large volume during rescue breathing because it can be harmful. It can force air into the stomach, causing regurgitation of food, liquids, or vomit into the airway.*

Mouth-to-Mouth-and-Nose Technique

There may be a rare or extraordinary circumstance when a barrier device is not available, and a CPR provider is willing to provide artificial ventilation without a barrier. For infants, the preferred technique is mouth-to-mouth-and nose rescue breathing.

To give mouth-to-mouth-and nose rescue breathing to an infant:

- Open the airway with a head tilt-chin lift.
- Maintain a neutral "sniffing" position. Take a regular-sized breath and place your mouth over the infant's mouth and nose, creating an airtight seal.
- Give 1 breath over 1 second.
- Give enough air to make the chest visibly rise, but no more than that.
  - If the chest does not rise, repeat the head tilt–chin lift to make a better seal, and try again.
  - It may be necessary to move the infant's head through a range of positions to provide effective rescue breathing.
- If you have difficulty making an effective seal over the mouth and nose, try using the mouth-to-mouth technique.

INFANT – AUTOMATED EXTERNAL DEFIBRILLATION & USING AN AED

An automated external defibrillator (AED) is a portable computerized device that is simple to operate. It can identify the abnormal heart rhythms associated with sudden cardiac arrest – pulseless ventricular tachycardia and ventricular fibrillation – and deliver an electrical shock to restore the heart's normal contractions. If the electrical shock is effective, there will be a return of spontaneous circulation. The heart will be able to pump blood. The infant may also start breathing, moving, or reacting in other ways.

AED Design

AED design varies by model and manufacturer, but they all operate in a similar manner. If you have an AED in your workplace, be familiar with its operation. Most AEDs are designed for both adult and pediatric use. The energy level of the shock for pediatric use is reduced from the standard adult energy setting. The shock is reduced by an electronic device built into the AED and activated using a button, "key," or another type of switching mechanism.

AED Operation

Choosing the AED Pads

Pediatric pads are recommended for children under 8 years of age. If the child pads are not available, use the adult pads. The standard adult shock will be higher, but a higher energy shock is better than no shock at all.

Power on the AED

Power on the AED and bare the infant's chest. If there is a button, "key," or another type of mechanism for switching to pediatric use, activate it.

Bare the Chest

Proper AED operation requires direct contact between the pads and the infant's skin. Any clothing in the way must be removed. If necessary, cut through clothing with the shears that are typically included with a CPR AED response kit.

Apply the AED Pads

Peel the pads from the backing sheet one at a time and place each according to the pictures. The front and back position is common for infants. Press the pads firmly in place. Do not allow them to touch each other.

Allow AED Analysis

When the AED voice prompts you, make sure no one is touching the infant. This allows the AED to analyze the heart rhythm.

Deliver a Shock

If the AED advises a shock, it will prompt you to clear the person again. Loudly say, "Everybody clear," or something similar. For most AEDs, delivering a shock is done by pressing the shock button. Deliver a shock. Once a shock has been delivered, immediately resume CPR starting with chest compressions.

Follow the Voice Prompts

After about 2 minutes of CPR, the AED will prompt you again to analyze the heart rhythm. Follow the voice prompts.

Continue CPR AED

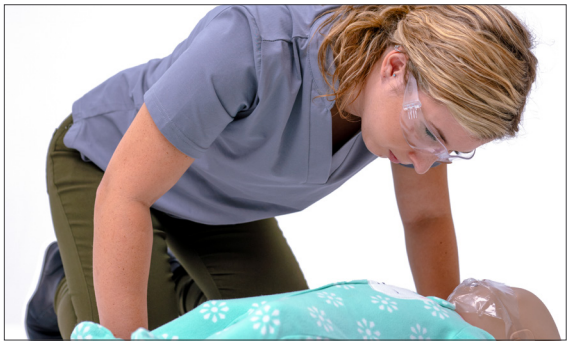
Continue CPR and AED use until another CPR provider, someone with more advanced training, or EMS providers arrive and take over, or until the person starts breathing, moving, or reacting in other ways.

Reassess Regularly

If the infant begins responding, regularly reassess their responsiveness, airway, and breathing.

INFANT – ONE-PROVIDER CPR AED

One pediatric CPR provider can provide high-quality infant CPR by putting together all the skills of assessment, compressions, airway, breathing, and AED use.



Perform an Assessment

- First, assess scene safety, taking Standard Precautions. If the scene is safe, assess the infant's responsiveness. Tap the infant and ask loudly, "Are you okay?"
- If the infant is unresponsive, call 911 to activate EMS using a mobile device and/or activate your EAP.
- After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED.
- Assess the infant's breathing for no more than 10 seconds.
- If the unresponsive infant is not breathing normally or only gasping, and you are alone, immediately start CPR, beginning with chest compressions.

Perform High-Quality Chest Compressions

- Position the infant on a firm, flat surface. Using one of the hand-position techniques, perform 30 high-quality chest compressions. Compress the chest at least 1 ½ inches (4 centimeters). Compress at a rate of 100-120 times per minute. Allow the chest to fully recoil at the top of each compression.

Give Rescue Breaths

- Use an infant CPR mask to give rescue breaths. Open the airway and give 2 rescue breaths. Ensure each breath is 1 second in length and creates visible rise of the chest.

Continue CPR

- Immediately resume high-quality chest compressions.
- Repeat CPR cycles of 30 compressions and 2 breaths for 2 minutes.
- If you are alone without a mobile device, give 2 minutes of CPR before leaving the infant, or carrying them with you, to get an AED and activate EMS or your EAP – if you have not done so already.

Operate the AED

- As soon as an AED is available, power on the AED. Bare the chest. If there is a button, "key,"

or another type of mechanism for switching to pediatric use, activate it.

- Correctly apply the pediatric pads according to the pictures. If the pediatric pads are not available, use the adult pads. Follow the AED's voice prompts.

Continue CPR AED

- After about 2 minutes of CPR, the AED will prompt you to analyze the heart rhythm. Follow the voice prompts.
- Continue CPR and AED until another CPR provider, someone with more advanced training, or EMS providers arrive and take over, or until the infant starts breathing, moving, or reacting in other ways.
- If another CPR provider arrives, takes turns giving compressions. Switch providers about every 2 minutes, sooner if they get tired. Try to minimize interruptions to compressions to less than 10 seconds.

INFANT – ADDITIONAL CPR AED CONSIDERATIONS

A CPR provider may face some circumstances that require additional considerations or tasks for effective care. Act quickly if anything affects AED use to keep this link in the chain strong.

In Water

Do not use an AED if the infant is immersed in water. The infant must be removed from water before using an AED.

Wet Setting

If the infant is in a wet setting, such as lying on snow or ice, in rain, on a wet floor or deck, or in a small puddle, it is safe to use the AED. If the chest is wet, quickly dry it before applying pads.

On Metal

AEDs can be used safely on metal surfaces, such as gratings or stairwells. Make sure the pads do not directly touch any metal surface when the AED is powered on.

Jewelry

If the AED pads are not in contact with metal jewelry, the jewelry does not have to be removed.

INFANT – SUSPECTED OPIOID-ASSOCIATED EMERGENCY (OAE)

Prescription opioid misuse has become a leading cause of unintentional injury and death among adolescents and young adults in the United States.[82] Seventy percent of drug overdose deaths involve a prescription or illicit opioid such as oxycodone, hydrocodone, morphine, fentanyl, or heroin. Accidental opioid ingestions occur in infants and very young children, mirroring the opioid epidemic in adolescents and adults.[83] Recognizing an opioid overdose can be difficult. Signs of an overdose may include:

- Small, constricted "pinpoint pupils,"
- Changes in skin appearance and condition,
- Falling asleep or loss of consciousness,
- Slow, shallow breathing,
- Choking or gurgling sounds, and
- Limp body.

Opioids can cause death by slowing, and eventually stopping, breathing. A quick response to an opioid overdose, including administering naloxone, can prevent brain injury and death. Naloxone is a medication approved by the Food and Drug Administration, or FDA, designed to rapidly reverse opioid overdose. Naloxone is available without a prescription in all U.S. states, the District of Columbia and Puerto Rico. Narcan® Nasal Spray is the most commonly prescribed opioid reversal medication. Narcan® Nasal Spray is approved for the emergency treatment of known or suspected opioid overdose in children of all ages.[84]

Using Narcan® Nasal Spray

To use Narcan® Nasal Spray, peel back the package to remove the device. Hold the device with your thumb on the bottom of the plunger and 2 fingers on the nozzle. Place and hold the tip of the nozzle in either nostril until your fingers touch the bottom of the person's nose. Press the plunger firmly to release the dose into the nose.

Procedure for Suspected OAE

If you suspect an opioid-associated emergency, assess scene safety. Take Standard Precautions. **Avoid contact with drug residue, containers, needles, and other paraphernalia**. Assess responsiveness. Tap the infant and ask loudly, "Are you okay?" If the infant is unresponsive, activate EMS and/or your EAP. After activating, and unless they are readily available to you, send someone to get the first aid kit, naloxone, and an AED. Assess the infant's breathing for no more than 10 seconds. If the infant is not breathing normally or only gasping, start high-quality CPR. Use the AED as soon as one becomes available. Give naloxone as soon as you can, but do not delay CPR and AED use to give it.

If an unresponsive infant is breathing normally, give naloxone if available. To help protect the airway, place the infant in the recovery position. If the infant does not respond, another dose may be given in the same way. Narcan® Nasal Spray may be dosed every 2 to 3 minutes, if available.

82 Hudgins JD, Porter JJ, Monuteaux MC, Bourgeois FT. Prescription opioid use and misuse among adolescents and young adults in the United States: A national survey study. PLoS Med. 2019 Nov 5;16(11):e1002922. doi: 10.1371/journal.pmed.1002922

83 Crane, EH. Emergency department visits involving the accidental ingestion of opioid pain relievers by children aged 1 to 5. Available: https://www.samhsa.gov/data/sites/default/files/report_3398/ShortReport-3398.html [Retrieved 12/9/2021]

84 Department of Health and Human Services Public Health Service Food and Drug Administration, February 12, 2019. Available: https://www.fda.gov/media/123725/download [Retrieved 7/16/21]

INFANT– RELIEF OF CHOKING

Choking, also known as foreign-body airway obstruction, can occur when a solid object, such as a piece of food or a small object, becomes stuck in the upper airway. The infant cannot breathe. If an infant appears to be choking but is responsive, watch for signs of the obstruction becoming severe.

Mild Airway Obstruction

If there is a good air exchange with a mild airway obstruction – the infant is coughing forcefully, has a strong cry, and can inhale and exhale – stand ready to help if things get worse.

Severe Airway Obstruction

With a severe airway obstruction, the infant may cough weakly, be unable to cry, or be unable to make any sound at all. There may be a high-pitched noise when the infant tries to inhale.

Responsive Infant

If the infant is responsive and you are not alone, have someone call 911 to activate EMS using a mobile device and/or activate your EAP.

Position Yourself and the Infant

- Kneel or sit with the infant in your lap. Hold the infant facedown over your forearm with legs straddled and with the head lower than the chest. Support the head by holding the jaw. Rest your forearm on your lap or thigh to support the infant.

Give 5 Back Slaps

- Using the heel of the other hand, give up to 5 back slaps between the shoulder blades. Give each back slap forcefully with the intent of dislodging and expelling the object.

Give 5 Chest Thrusts

- Sandwich the infant between your forearms and turn the infant over, using the palm of one hand to support the face and the palm of the other hand to support the back of the head.
- Place 2 fingertips on the breastbone just below the nipple line and give up to 5 chest thrusts. Give each chest thrust forcefully with the intent of dislodging and expelling the object. Repeat the sequence of back slaps and chest thrusts until the object is expelled and the infant can breathe or becomes unresponsive.

If the Infant Becomes Unresponsive

If the infant becomes unresponsive, carefully lower them to the ground. Call 911 to activate EMS using a mobile device and/or activate your EAP if you have not done so already. Send someone to get the first aid kit and an AED. After activating, and unless they are readily available to you, send someone to get the first aid kit and an AED. Begin CPR starting with compressions. Before opening the airway to provide rescue breaths, open the mouth wide. Only if you see an object, carefully remove it with your fingers. Do not stick your finger blindly in an infant's throat and attempt to sweep out an object. This can cause injury or push the object further down the throat, worsening the obstruction.

If You Are Alone Without a Mobile Device

If you are alone without a mobile device, give 2 minutes of CPR before leaving the infant, or carrying them with you, to get an AED and activate EMS or your EAP – if you have not done so already. Continue until another CPR provider, someone with more advanced training, or EMS providers arrive and take over, or until the infant starts breathing, moving, or reacting in other ways.

section five

APPENDIX

PROCEDURE FOR ADULT FIRST AID, CPR AED

PERFORM AN ASSESSMENT

- Assess **Scene Safety**
- Take Standard Precautions*
- Assess **Responsiveness**
- Activate **EMS** and/or **EAP**†
- Send Someone to Get a First Aid Kit & AED (unless readily available to you)

ASSESS BREATHING FOR NO MORE THAN 10 SECONDS

RESPONSIVE, BREATHING

OBTAIN CONSENT

- Introduce yourself and ask, "May I help you?"
- Assess for life-threatening conditions.‡ If present, immediately provide appropriate first aid.
- If person shows signs of shock and has no difficulty breathing, keep them lying down, face up.

PERFORM A SECONDARY ASSESSMENT

- Ask the person to describe the current problem.
- Look for medical identification jewelry.
- Visually assess an injured person from head to toe. Look for Deformities and Open injuries. Ask about Tenderness and Swelling. (DOTS)
- Provide appropriate first aid for any problems found.

UNRESPONSIVE, BREATHING NORMALLY

MAINTAIN AN OPEN AIRWAY

- Place an uninjured, unresponsive person on their side in the recovery position to help protect the airway.
- Assess for life-threatening conditions.‡ If present, immediately provide appropriate first aid.
- Give naloxone for suspected opioid overdose (if available).

UNRESPONSIVE, NOT BREATHING NORMALLY OR ONLY GASPING

START CONVENTIONAL CPR

- Position person on a firm, flat surface.
- Perform cycles of 30 high-quality chest compressions and 2 rescue breaths.§
- If another trained CPR provider is available, take turns performing compressions. Switch quickly, about every two minutes.
- Give naloxone for suspected opioid overdose, but do not delay CPR AED to give it.

UNRESPONSIVE. NOT BREATHING NORMALLY . USE THE AED AS SOON AS IT IS AVAILABLE. APPLY PADS TO PERSON'S BARE CHEST. FOLLOW AED PROMPTS.

SHOCK ADVISED?

YES

- Clear the person.
- Give 1 shock.
- Immediately resume high-quality CPR.
- Follow AED prompts.

NO

- Immediately resume high-quality CPR.
- Follow AED prompts.

CONTINUE UNTIL OTHER CPR OR EMS PROVIDERS TAKE OVER OR THE PERSON STARTS RESPONDING (BREATHING, MOVING, REACTING).

* Use appropriate personal protective equipment (PPE) to protect against possible exposure to infectious agents. PPE may include gloves, goggles or face shields, surgical masks, gowns, respirators, and CPR masks. Wash your hands immediately after removing gloves.

† If you are not sure an emergency exists or when any person is unresponsive, badly hurt, looks or acts very ill, or quickly gets worse - call 911 to activate Emergency Medical Services (EMS) using a mobile device and/or activate your emergency action plan (EAP). Listen to the dispatcher's instructions.

‡ Including severe external bleeding, shock, altered mental status, breathing difficulty, choking, severe allergic reaction, stroke, and chest pain or discomfort.

§ For adults and teens in cardiac arrest, untrained bystanders and trained CPR providers should at a minimum provide compression-only CPR, with or without dispatcher assistance. If willing and able, trained CPR providers should perform conventional CPR at ratio of 30 compressions to 2 rescue breaths. In the case of drowning, begin with 2 rescue breaths.

PROCEDURE FOR ADULT CPR AED

PERFORM AN ASSESSMENT

- Assess **Scene Safety**
- Take Standard Precautions*
- Assess **Responsiveness**
- Activate **EMS** and/or **EAP**†
- Send Someone to Get a First Aid Kit & AED (unless readily available to you)

ASSESS BREATHING FOR NO MORE THAN 10 SECONDS

UNRESPONSIVE, BREATHING NORMALLY

MAINTAIN AN OPEN AIRWAY

- Place an uninjured, unresponsive person on their side in the recovery position to help protect the airway.
- Give naloxone for suspected opioid overdose (if available).

UNRESPONSIVE, NOT BREATHING NORMALLY OR ONLY GASPING

START CONVENTIONAL CPR

- Position person on a firm, flat surface.
- Perform cycles of 30 high-quality chest compressions and 2 rescue breaths.§
- If another trained CPR provider is available, take turns performing compressions. Switch quickly, about every two minutes.
- Give naloxone for suspected opioid overdose, but do not delay CPR AED to give it.

UNRESPONSIVE. NOT BREATHING NORMALLY. USE THE AED AS SOON AS IT IS AVAILABLE. APPLY PADS TO PERSON'S BARE CHEST. FOLLOW AED PROMPTS.

SHOCK ADVISED?

YES

- Clear the person.
- Give 1 shock.
- Immediately resume high-quality CPR.
- Follow AED prompts.

NO

- Immediately resume high-quality CPR.
- Follow AED prompts.

CONTINUE UNTIL OTHER CPR OR EMS PROVIDERS TAKE OVER OR THE PERSON STARTS RESPONDING (BREATHING, MOVING, REACTING).

* Use appropriate personal protective equipment (PPE) to protect against possible exposure to infectious agents. PPE may include gloves, goggles or face shields, surgical masks, gowns, respirators, and CPR masks. Wash your hands immediately after removing gloves.

† If you are not sure an emergency exists or when any person is unresponsive, badly hurt, looks or acts very ill, or quickly gets worse - call 911 to activate Emergency Medical Services (EMS) using a mobile device and/or activate your emergency action plan (EAP). Listen to the dispatcher's instructions.

§ For adults and teens in cardiac arrest, untrained bystanders and trained CPR providers should at a minimum provide compression-only CPR, with or without dispatcher assistance. If willing and able, trained CPR providers should perform conventional CPR at ratio of 30 compressions to 2 rescue breaths. In the case of drowning, begin with 2 rescue breaths.

PROCEDURE FOR PEDIATRIC CPR AED

PERFORM AN ASSESSMENT

- Assess **Scene Safety**
- Take Standard Precautions*
- Assess **Responsiveness**
- Activate **EMS** and/or **EAP**†
- Send Someone to Get a First Aid Kit & AED (unless readily available to you)

ASSESS BREATHING FOR NO MORE THAN 10 SECONDS

UNRESPONSIVE, BREATHING NORMALLY

MAINTAIN AN OPEN AIRWAY

- Place an uninjured, unresponsive child on their side in the recovery position to help protect the airway.
- Cradle an infant in your arms, with their head tilted downwards.
- Give naloxone for suspected opioid overdose (if available).

UNRESPONSIVE, NOT BREATHING NORMALLY OR ONLY GASPING

START CONVENTIONAL CPR

- Position child or infant on a firm, flat surface.
- Perform cycles of 30 high-quality chest compressions and 2 rescue breaths.‡
- If alone after about 2 minutes, activate EMS and/or EAP and get an AED (if not already done).
- Return to the infant or child, continue CPR, and use the AED.
- Give naloxone for suspected opioid overdose (if available).

UNRESPONSIVE. NOT BREATHING NORMALLY. USE THE AED AS SOON AS IT IS AVAILABLE. APPLY PADS TO PERSON'S BARE CHEST. FOLLOW AED PROMPTS.

SHOCK ADVISED?

YES	NO
Clear the child/infant.	Immediately resume high-quality CPR.
Give 1 shock.	Follow AED prompts.
Immediately resume high-quality CPR.	
Follow AED prompts.	

CONTINUE UNTIL OTHER CPR OR EMS PROVIDERS TAKE OVER OR THE PERSON STARTS RESPONDING (BREATHING, MOVING, REACTING).

* Use appropriate personal protective equipment (PPE) to protect against possible exposure to infectious agents. PPE may include gloves, goggles or face shields, surgical masks, gowns, respirators, and CPR masks. Wash your hands immediately after removing gloves.

† If you are not sure an emergency exists or when any child or infant is unresponsive, badly hurt, looks or acts very ill, or quickly gets worse - call 911 to activate Emergency Medical Services (EMS) using a mobile device and/or activate your emergency action plan (EAP). Listen to the dispatcher's instructions.

‡ In the case of drowning, begin with 2 rescue breaths. Child compressions: Push in the middle of the chest about 2 inches (5 cm) with one or two hands. Infant Compressions: Push in the middle of the chest about 1 ½ inches (4 cm) with 2-Finger Technique or 2-Thumb Encircling-Hands Technique. Rescue breaths are extremely important for infants and children. If CPR providers are unwilling or unable to deliver breaths, perform compression-only CPR, as it is preferable to no CPR.

PROCEDURE FOR ADULT FIRST AID

PERFORM AN ASSESSMENT

- Assess **Scene Safety**
- Take Standard Precautions*
- Assess **Responsiveness**
- Activate **EMS** and/or **EAP**†
- Send Someone to Get a First Aid Kit & AED (unless readily available to you)

ASSESS BREATHING FOR NO MORE THAN 10 SECONDS

RESPONSIVE, BREATHING

OBTAIN CONSENT

- Introduce yourself and ask, "May I help you?"
- Assess for life-threatening conditions.‡ If present, immediately provide appropriate first aid.
- If person shows signs of shock and has no difficulty breathing, keep them lying down, face up.

PERFORM A SECONDARY ASSESSMENT

- Ask the person to describe the current problem.
- Look for medical identification jewelry.
- Visually assess an injured person from head to toe. Look for Deformities and Open injuries. Ask about Tenderness and Swelling. (DOTS)
- Provide appropriate first aid for any problems found.

UNRESPONSIVE, BREATHING NORMALLY

MAINTAIN AN OPEN AIRWAY

- Place an uninjured, unresponsive person on their side in the recovery position to help protect the airway.
- Assess for life-threatening conditions.‡ If present, immediately provide appropriate first aid.
- Give naloxone for suspected opioid overdose (if available).

UNRESPONSIVE, NOT BREATHING NORMALLY OR ONLY GASPING

START COMPRESSION-ONLY CPR§

- Position adult or teen on a firm, flat surface.
- Push hard and fast in the center of the chest.
- If another person is available, take turns performing compressions. Switch quickly, about every two minutes.
- Continue until trained CPR or EMS providers takeover or the person starts responding (breathing, moving, reacting).
- Give naloxone for suspected opioid overdose, but do not delay CPR to give it.

* Use appropriate personal protective equipment (PPE) to protect against possible exposure to infectious agents. PPE may include gloves, goggles or face shields, surgical masks, gowns, respirators, and CPR masks. Wash your hands immediately after removing gloves.

† If you are not sure an emergency exists or when any person is unresponsive, badly hurt, looks or acts very ill, or quickly gets worse - call 911 to activate Emergency Medical Services (EMS) using a mobile device and/or activate your emergency action plan (EAP). Listen to the dispatcher's instructions.

‡ Including severe external bleeding, shock, altered mental status, breathing difficulty, choking, severe allergic reaction, stroke, and chest pain or discomfort.

§ For adults and teens in cardiac arrest, untrained bystanders and persons not trained in CPR should perform compression-only CPR, with or without dispatcher assistance. CPR using chest compressions with rescue breaths should be provided to infants and children in cardiac arrest. If unwilling or unable to deliver breaths, perform compression-only CPR, as it is preferable to no CPR.

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