FIRST AID | CPR AED

STUDENT BOOK

VERSION 10, 2026

HSI

First Aid | CPR AED

Student Book, Version 10.0, 2026

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This *HSI First Aid | CPR AED Student Book*, Version 10.0, is a resource for students who desire or are required to become trained first aid and/or CPR AED providers. It contains required and supplemental training content in first aid topics, with a focus on first aid for adults in occupational settings, and CPR AED for an adult, child, and infant.

Several images in this student book are AI generated.

This student material is not intended to meet regulatory requirements for pediatric first aid training and should not be used for that purpose.

HSI is the successor organization to American Safety and Health Institute (ASHI), MEDIC First Aid, and EMS Safety.

Health & Safety Institute
1450 Westec Drive
Eugene, OR 97402 USA
800-447-3177
hsi.com/brands
E-mail: *response@hsi.com*
Visit our website at *hsi.com*

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About This Student Book

In 2020, HSI began the process of transitioning several emergency care training brands (American Safety and Health Institute [ASHI], MEDIC First Aid, and EMS Safety) into a single unified one – HSI. While this brand consolidation is complete, HSI's certification cards and training materials continue to carry the ASHI, EMS Safety, and MEDIC First Aid logos to address the risk of confusion in the market, and among regulators and others. With time, these logos will be fully phased out.

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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 Like any published material, this material may become out of date over time.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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HSI Medical Advisory Board

Geoffrey M. Hersch, DDS
Jeffrey T. Lindsey, PhD, PM, EFO
Joe A. Nelson, DO, MS, FACOEP-D, FACEP
Nerina Stepanovsky, PhD, MSN, PM
Marvin Wayne, MD, FACEP, FAAEM, FAHA

HSI Advisory Council

Authorized HSI Instructors:

Javier Flores
Alvin F. Hargrove
Melanie Lofstedt
Samuel Palagi, MA I/C, EMTP
Cheryl Smith, BS, MBA
Duane Whatley, NRP

This student book 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.

NOTICE: This HSI student book has been approved by the HSI Medical Board. It reflects the latest first aid and resuscitation science and treatment recommendations of the 2025 International Consensus on Cardiopulmonary Resuscitation (CPR) and Emergency Cardiovascular Care (ECC) Science with Treatment Recommendations (CoSTR) and the 2025 International Consensus on First Aid Science with Treatment Recommendations published by the International Liaison Committee on Resuscitation (ILCOR). It conforms with the 2025 American Heart Association®, Inc. (AHA) Guidelines Update for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiovascular Care (ECC), the 2024 AHA and American Red Cross (ARC) Focused Update for First Aid, and the 2025 American Red Cross First Aid Guidelines. HSI First Aid | CPR AED training programs are currently accepted, approved, or recognized as an industry credential meeting the requirements of thousands of U.S. state regulatory agencies, occupational licensing boards, national associations, commissions, and councils in hundreds of occupations and professions.

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USING THIS STUDENT BOOK

This First Aid | CPR AED Student Book contains the information you'll need to understand and perform to provide lifesaving first aid and cardiopulmonary resuscitation (CPR). You will practice many of these important skills during your class with the assistance and supervision of an HSI Authorized 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. FIRST AID | ADULT CPR AED
2. FIRST AID | ADULT, CHILD, AND INFANT CPR AED
3. FIRST AID | ADULT AND CHILD CPR AED
4. FIRST AID | ADULT AND INFANT CPR AED
5. FIRST AID
6. CPR AED ADULT, CHILD, AND INFANT
7. CPR AED ADULT AND CHILD
8. CPR AED ADULT AND INFANT
9. CPR AED ADULT

Treatment recommendations and skills covered in this student book are comprehensive. That is, the content covers adult first aid and adult, child, and infant CPR AED. Some of this content may not have been included in your training, depending on the class type and certification offered. This student book also includes supplemental topics and safety and health tips that may not have been covered in class.

SECTION ONE

INTRODUCTORY LESSONS

INTRODUCTION TO EMERGENCY CARE

Medical emergencies can happen anywhere, at any time. There are over 155 million emergency department visits in the United States every year, 43.5 million for injuries alone.[1] Every year, thousands of workers die on the job.[2] Millions of workplace injuries and illnesses occur 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 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.

This student book is intended for individuals who desire, or are occupationally required, to be trained in adult first aid, cardiopulmonary resuscitation (CPR), and automated external defibrillation.

The purpose of this student book is for participants to gain or improve knowledge and skill proficiency in adult first aid and/or CPR AED.

Definitions

First Aid. Defined as "helping behaviors and 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.

First Aid Provider. Someone trained in first aid who can recognize, assess, and prioritize the need for first aid, as well as provide care using appropriate skill competencies. A first aid provider recognizes their own limitations and initiates getting more help on the way when needed. First aid providers are typically also trained in conventional CPR.

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

Conventional CPR. An emergency procedure that combines chest compressions with breaths to circulate oxygenated blood to the brain and heart, increasing the possibility of successful resuscitation.

Compression-Only CPR. Chest compressions without breaths. A simplified form of CPR and the preferred adult CPR technique to be performed by an untrained bystander, with or without 911 dispatcher assistance. Compression-only CPR isn't recommended for children. Breaths are extremely important for children because cardiac arrest typically occurs after an interruption of breathing or from inadequate oxygen in the body (asphyxia).

CPR Provider. Someone trained in conventional CPR and the use of automated external defibrillators (AEDs).

First Aid Care

First aid care begins when the first aid provider begins to assess and assist the ill or injured person and continues until the person no longer needs care, EMS providers arrive, or the person is under the care of a hospital or urgent care facility.

To provide first aid, approach the ill or injured person with compassion and without judgment. Focus on their immediate first aid needs.

Use simple, clear language and be patient. Use a calm voice and manner to help reduce the person's fear and anxiety. Use their name if you know it. If necessary, use translation assistance from bystanders or technology. Recognize that cultural and religious beliefs may influence how a person reacts to illness or injury.

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.

Procedures for First Aid | CPR AED

A procedure is "a particular way of accomplishing something or of acting."[3] Procedures are simple step-by-step diagrams with instructions that provide guidance for assessing, prioritizing, and performing first aid, CPR AED, foreign-body airway obstruction relief, and life-threatening external bleeding control. They are modeled after "decision tree" type medical algorithms and are based on scientific evidence, national guidelines, and the consensus of experts. Procedure graphics can be found in the *HSI First Aid | CPR AED Skill Guide* and the appendix of this student book. It may be helpful to review the procedures that align with your training.

Infection Control

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."[4]

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.[5] Hand hygiene and the use of appropriate personal protective equipment (PPE) are fundamental elements of infection control.

The phrase "take standard precautions" is used throughout this student book 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.

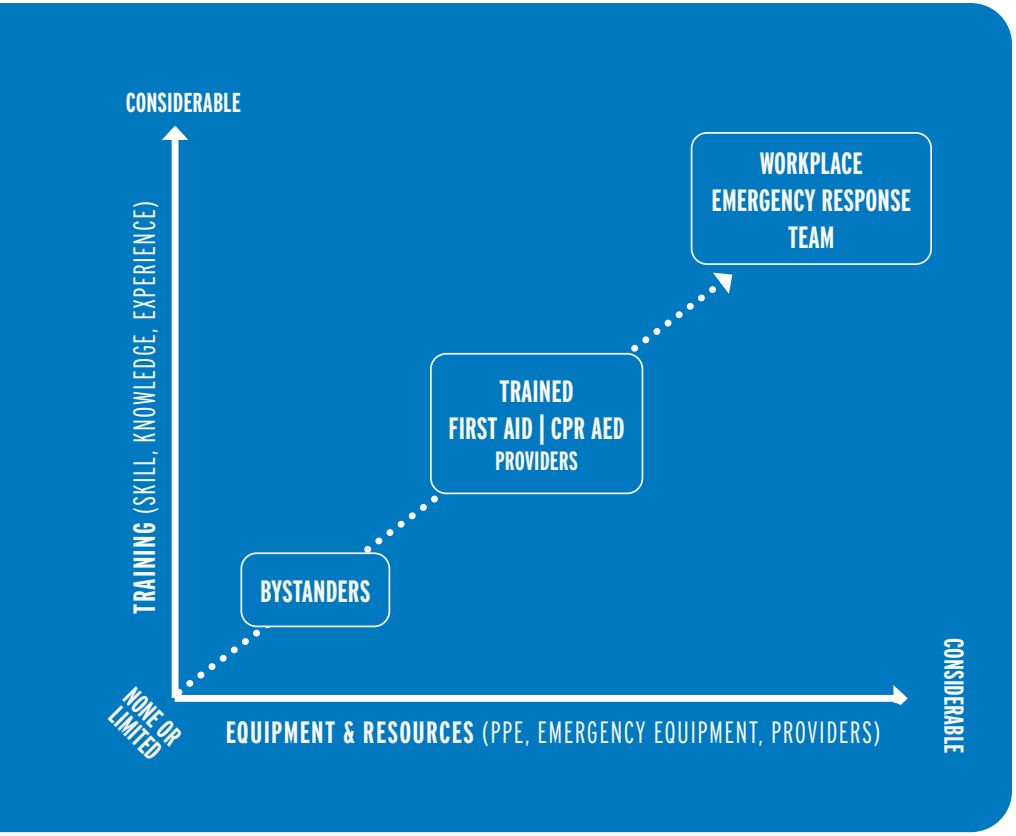
Experience putting on and taking off PPE, also called donning and doffing, is critical for the safety of designated first aid providers and helps to minimize potential delays in first aid. Designated first aid providers should frequently train and practice with their employer-provided PPE and established procedures. The responsibility for providing, laundering, cleaning, repairing, replacing, and disposing of PPE, at no cost to employees, rests with the employer.[6]

This student book 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."[7] The continuum in first aid/CPR AED can be represented by a linear scale on two axes. On the horizontal axis is *equipment and resources*. On the vertical axis is *training* (Fig.1). Each axis begins at "none or limited" and scales up to "considerable."

Figure 1



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 include 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.

On the high end of the continuum is an Emergency Response Team (ERT), also called an Incident Response Team. 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 AED, 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.

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.[8]

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 colleague, loved one, or even 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.[9,10] Good Samaritan laws are intended to encourage people to help others in an emergency without having to worry about being sued (see Legal Concepts).

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 (see Responding to an Emergency).

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.[11] Still, a person in cardiac arrest is without a heartbeat and is not breathing normally. CPR is potentially lifesaving. Injuries from performing it do not make a person who is without a heartbeat and breathing "worse." **Any type of CPR is associated with doubled survival rates in comparison with no CPR.**[12]

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

These are normal human reactions to a traumatic event. Calm yourself as best you can and acknowledge your limitations. When an emergency is over, a first aid and/or CPR 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 repeatedly
- 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 judgement, 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 trained providers need to be familiar with.

Duty to Rescue[13,14]

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.

Provide Aid

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 the injury or death of any person would have that duty.

Some people, because of their occupation, have a legal duty to provide first aid. This includes firefighters, law enforcement officers, lifeguards, schoolteachers, and others.

Good Samaritan Definition[15]

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

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 the worry of 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.[16]

Good Samaritan Laws in Your State

To locate the Good Samaritan law for the US state you live or work using the following internet search string will usually produce the best result: "Good Samaritan Act, immunity from civil liability, [state]" (where [state] is the state law desired). Select the link that points to the official state government law.

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: Expressed consent can be given verbally, in writing, or non-verbally, like 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 is implied when circumstances lead a reasonable person to believe that consent would be given but it was not expressed. Implied consent in an emergency usually occurs when you are 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.

Abandonment

To be abandoned is to be left without needed protection, care, or support. Although there is generally no duty to rescue, 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.

Assault & 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.[17] *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.*

Confidential Medical Information

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

ROLES, RESPONSIBILITIES & PRIORITIES

Recognize, Assess, and Prioritize

A trained provider must be able to recognize, assess, and prioritize the need for care.

Trained providers should assess the ill or injured person by checking for responsiveness, breathing, and injuries. Any change in responsiveness, difficulty breathing, or the presence of major injuries should be viewed as an emergency, including but not limited to severe life-threatening bleeding; head, neck or spine injuries; suspected internal bleeding; or severe burns.

Provide Care by Using Appropriate Skill Competencies

A trained provider gives care using appropriate skill competencies. Skill competency in first aid and CPR AED is the ability to use knowledge and skills confidently and effectively in alignment with training.

Learning, practicing, and using step-by-step procedures for handling life-threatening conditions will help you develop competency.

Recognize Limitations

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.

Seek additional professional help when needed.

RESPONDING TO AN EMERGENCY

Trained providers should follow established procedures for first aid and CPR AED. This step-by-step guidance is based on scientific evidence, national guidelines, and the consensus of experts. *When providing care, follow the procedures that align with your training (see appendix).*

When an emergency occurs, it may not be clear at first what kind of care the person needs.

These procedures list 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.

Assessment Steps

The first steps of each procedure are similar: Begin with assessment.

1. Assess scene safety.
2. Take standard precautions.
3. Assess responsiveness.
4. Activate EMS and/or your emergency action plan (EAP).
5. Send someone to get a first aid kit and an AED.
6. Assess breathing for at least 5 seconds and no more than 10 seconds.

PERFORM AN ASSESSMENT

ASSESS SCENE SAFETY | TAKE STANDARD PRECAUTIONS* | ASSESS RESPONSIVENESS | ACTIVATE EMS &/OR EAP† | SEND SOMEONE TO GET A FIRST AID KIT & AN AED

ASSESS BREATHING FOR AT LEAST 5 SECONDS & NO MORE THAN 10 SECONDS

Assess Scene Safety

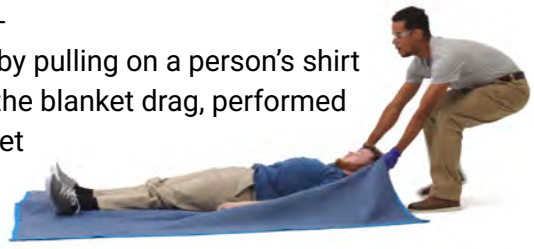
Emergency scenes can be dangerous. Your personal safety is the highest priority, even before the safety of an ill or injured person. Always pause for a moment before approaching. Look for obvious hazards and consider the possibility of hidden dangers. If the scene is unsafe, do not approach it. Activate EMS and/or your EAP.

Emergency Moves

It is best not to move an ill or injured person, especially when you suspect a spinal or pelvic injury. Only move a victim when there is an immediate danger and you can act 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 without hurting yourself.



Common drags include the extremity drag, performed by grasping and pulling on the ankles or forearms; the clothing drag, performed by pulling on a person's shirt in the neck and shoulder area; and the blanket drag, performed by rolling a person onto a blanket and dragging the blanket.

Confined Spaces

Confined spaces are especially dangerous.[19] *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, the following: 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 are 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.

Take Standard Precautions

In this student book, "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.

Use appropriate PPE for the circumstance. Depending on your role as a provider, appropriate PPE may include gloves, goggles or face shields, surgical masks, gowns, respirators, and CPR masks.

During infectious disease outbreaks, take extra care to avoid exposure to potentially infectious bodily fluids, droplets, and airborne particles. Avoid unnecessary direct contact and limit the number of first aid providers near a potentially infectious person.

Practice Donning and Doffing

Practicing putting on and taking off PPE, also called donning and doffing, is critical for your safety and for minimizing 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.

Removal of Contaminated Gloves

Due to the risk of infection, proper removal of contaminated gloves is imperative.

- Avoiding bare skin, pinch the glove at either palm with the gloved fingers of the opposite hand.
- Gently pull the glove away from the palm and up towards the fingers, turning the glove inside-out without snapping.
- Gather the glove you just removed with your gloved hand.
- Carefully slide your bare index finger inside the wrist band of the gloved hand.
- Gently pull outwards and down, inverting the glove and trapping the first glove inside.
- Place contaminated gloves in a biohazard waste bag or as directed by your employer's bloodborne pathogens or PPE program.

Perform Hand Hygiene

Wash your hands immediately after removing gloves. Washing your hands immediately after an emergency is crucial to remove pathogens, contaminants, and debris that cause infection and disease. 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. [20]

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

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 victim 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 and/or EAP

If the person is unresponsive, or if you recognize the signs and symptoms of a life-threatening condition in a responsive person, or you are just unsure, call 911 to activate EMS using a mobile device and/or activate your occupational 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 provide first aid following their directions at the same time.

Emergency Action Plan (EAP)

An EAP is a written document required by workplace safety standards.[21] The purpose of an EAP is to facilitate and organize employer and employee actions during workplace emergencies.

EAPs consider the specific layout, size, and features of a particular worksite.

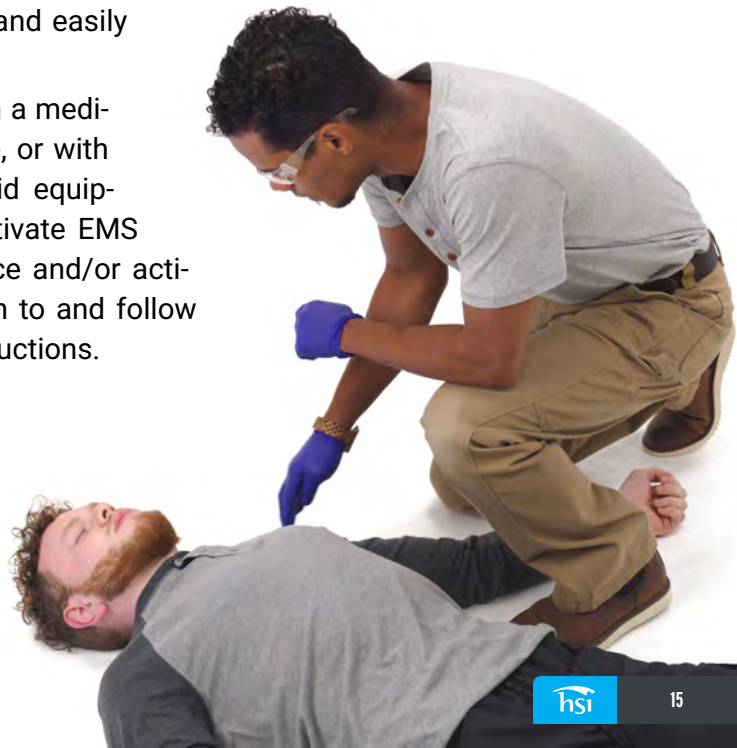
As a trained provider, you must know when and how to activate your EAP at work. It might be just calling 911 or you may have to use an internal telephone number, intercom, public address system, or a specialized emergency notification system.

Send Someone to Get a First Aid Kit and an AED

After activating, and unless they are readily available to you, send someone to get a first aid kit and an automated external defibrillator (AED).

The first aid kit should meet or exceed the minimum requirements for workplace first aid kits and supplies. Both the first aid kit and an AED should be in a well-marked, designated location from which they can be quickly and easily obtained.

If you find yourself in a medical emergency alone, or with no or limited first aid equipment, call 911 to activate EMS using a mobile device and/or activate your EAP. Listen to and follow the dispatcher's instructions.



Assess Breathing

Assess the person's breathing for at least 5 seconds and 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 on the person's responsiveness and breathing.

Unresponsive, Not Breathing Normally or Only Gasping

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

Conventional CPR combines chest compressions with breaths to circulate oxygenated blood to the brain and heart. Because CPR with breaths may lead to improved outcomes, trained CPR providers are encouraged to provide breaths with chest compressions.

Compression-only CPR is a simplified form of adult CPR. To give compression-only CPR, position the adult or teen on a firm, flat surface. Push hard and fast on the center of the chest. Continue until trained CPR or EMS providers take over or the person starts responding (breathing, moving, reacting).

Compression-only CPR is appropriate if the provider is untrained or unwilling to provide breaths. Compression-only CPR isn't appropriate or recommended for children.

Unresponsive, Breathing Normally

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 allows fluids to drain from the mouth. Place an uninjured, breathing, unresponsive person on their side in the recovery position to help protect the airway.

Assess for life-threatening conditions. If life-threatening conditions are present, immediately provide appropriate first aid.

Responsive, Breathing

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

Assess for life-threatening conditions, like severe external bleeding. If present, immediately provide appropriate first aid.

- If the person is having difficulty breathing, allow them to take whatever position is most comfortable for breathing, which is often sitting up.
- If the person has an injury to the neck, back, hip, or pelvis, leave them in the position they were found to avoid further injury, unless the scene becomes unsafe, and they must be moved.
- If the person shows signs of shock and has no difficulty breathing, keep them lying down, face up.

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

Secondary Assessment

Consider performing a secondary assessment to gather more information while waiting for EMS.

Ask the Person to Describe the Current Problem

Sometimes you can see signs of a problem, 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. Listen carefully and check to make sure you understand them.

Look for Medical Identification Jewelry

Medical identification jewelry can be a vital source of information if the person is confused, unable to speak, or becomes unresponsive. Look for a small emblem or tag worn on a bracelet, 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.

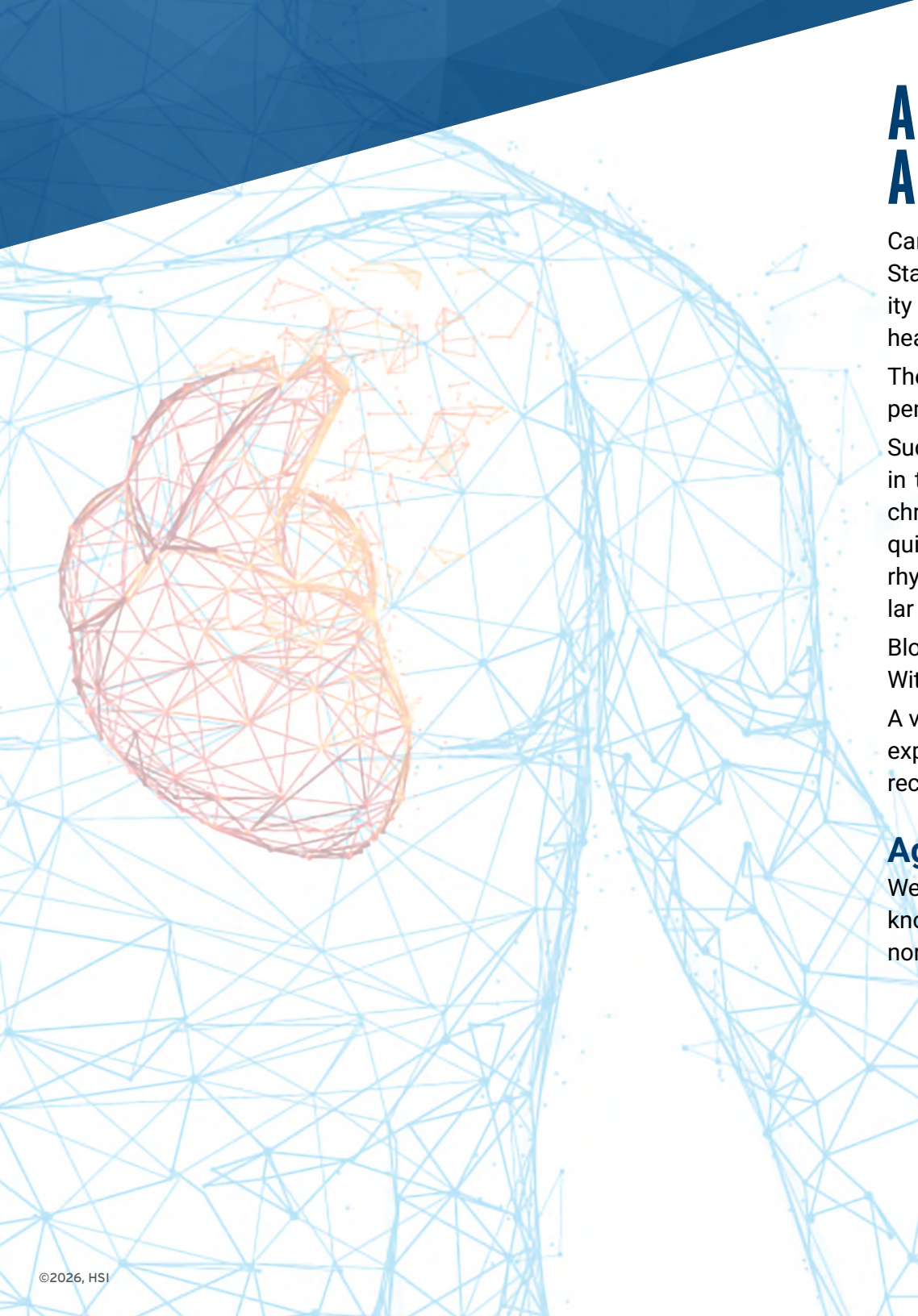
If necessary and with consent, remove or cut away clothing to get a better look at an injured or painful body part.

Provide appropriate first aid for any problems found. Keep the person as comfortable as possible. Protect them from exposure to excessive heat and cold. Regularly reassess scene safety, responsiveness, breathing, and the effectiveness of the first aid provided.

Calm, comfort, and reassure the person. Stay with them until someone with more advanced training takes over or EMS arrives. Pass on any information gathered.

SECTION TWO

ADULT CPR AED LESSONS



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.

Agonal Breaths Are a Sign of Cardiac Arrest

Weak or irregular gasping, snorting, snoring, or gurgling sounds are known as agonal breaths and may last for several minutes. This is not normal breathing. It is a sign of cardiac arrest.

Cardiopulmonary Resuscitation (CPR)

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 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 through the chest may restore the heart's normal contractions.

Chain of Survival

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 "Chain of Survival," a series of six interdependent links that describe the best approach to cardiac arrest care.

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

The Chain of Survival applies to adults, children, and infants. It consists of:

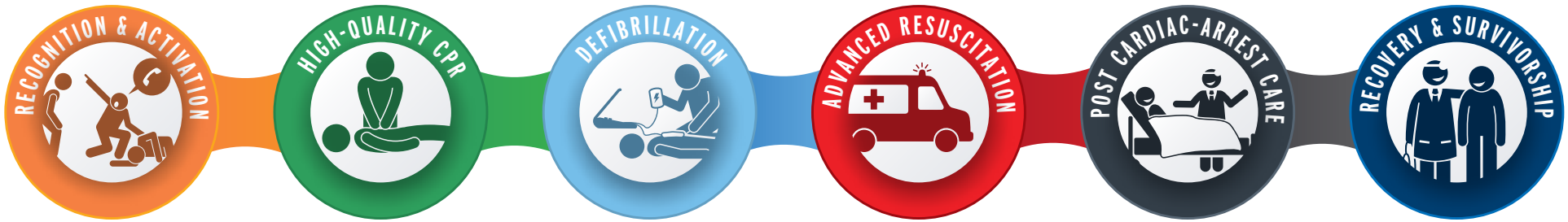
- Early recognition of cardiac arrest and prompt activation of EMS.
- Immediate high-quality CPR beginning with chest compressions.
- Early defibrillation with an AED, when indicated.
- Effective advanced life support treatment.
- Effective post-cardiac arrest care at a hospital.
- Recovery and survivorship.

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 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 and survivorship addresses the physical, intellectual, and emotional effects of surviving cardiac arrest.

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.[22]



ADULT - CHEST COMPRESSIONS

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

High-quality CPR is the single most critical intervention for a person in cardiac arrest.

High-quality Chest Compressions

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, there is an almost immediate drop in the blood pressure that drives blood flow through the heart. A key feature of high-quality CPR is to minimize interruptions in chest compressions. Minimal interruption improves blood flow. While some pauses in chest compressions are necessary, such as to give breaths, keeping interruption to a minimum is critical.

CPR should be performed where the victim is found if it is safe to do so. Position the person on a firm, flat surface when possible. Move any bulky clothing covering the chest out of the way.

CPR Provider Position

Optimal chest compressions are best delivered with the person on a firm surface, such as the floor. The effectiveness of compressions is maximized when the victim is face up and their torso is approximately at the level of the rescuer's knees. Position yourself at person's side, kneeling close to 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.[23] 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.

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 their technique based on data from a feedback device. Using a CPR feedback device is shown to improve outcomes and should be used during CPR training.

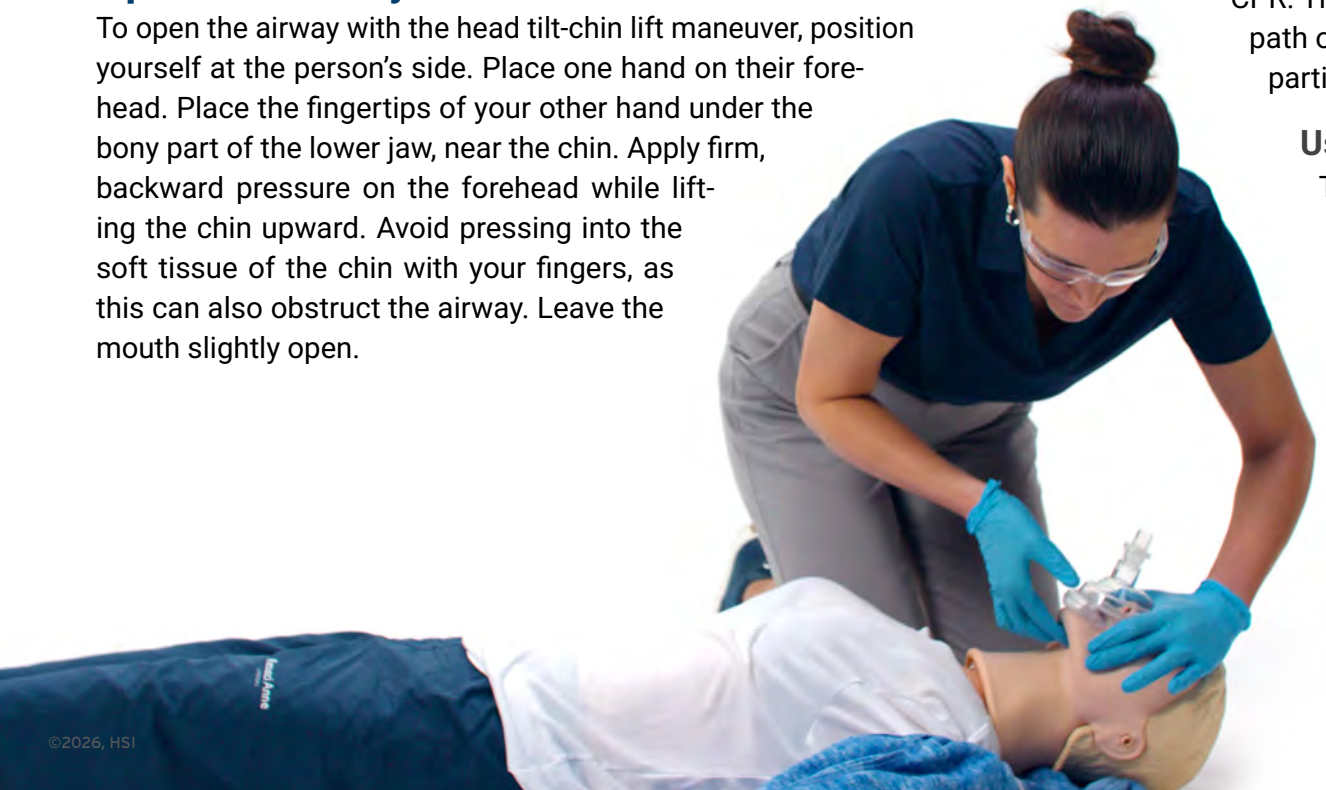
ADULT – AIRWAY, BREATHING & USING A CPR MASK

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

To give 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, opening the airway.

Open the Airway with 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.



Importance of Adult Breaths

Breaths are critically important in CPR, as they provide life-sustaining oxygen 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 of the heart, for example, when the person stops breathing because of drowning or from a drug or alcohol overdose.

Breaths

CPR providers can give breaths using their own exhaled breath and a CPR mask or face shield. Room air contains about 21% oxygen. Exhaled air contains between 16% and 17% oxygen. This exhaled oxygen is enough to support life.

Use of a CPR mask provides more effective breaths than mouth to face shield. 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.

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 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 breath as soon as you see chest rise. Remove your mouth and let the person exhale.

Too Many Breaths or Too Large Volume

CPR providers should avoid giving too many breaths or a large volume because it can be harmful. It can force air into the stomach, causing regurgitation of food, liquids, or vomit into the airway.

Giving too few breaths or too little volume should also be avoided because it is associated with decreased survival.

Give enough air to make the chest rise, but no more than that. Stop your breath as soon as you see chest rise.

Person with a Tracheostomy

A tracheostomy is a surgically created stoma (hole) through the front of the neck and into the trachea (windpipe). When providing breaths for a person with stoma, maintain the airway in a neutral position. Position a CPR mask over the stoma. A round pediatric CPR mask may be more effective in creating a tight seal than an adult mask. Give breaths by blowing through the valve opening of the CPR mask. Give enough air to create a visible rise of the chest, but no more.

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.

An AED may also indicate that no shock is needed and to resume compressions.

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.

Turn on the AED

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

Skin Contact

Proper AED operation requires direct contact between the pads and the person'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.

You may adjust the position of a person's bra, rather than removing it, when placing AED pads. Ensure pad placement matches the pictures and that there is direct contact between the pads and the person's skin.

The need to apply pads directly to the bare chest may be contributing to the significantly lower rates of AED use on females compared to males in public settings. The option to adjust the bra rather than "bare the chest" may help reduce the discomfort with exposing a woman's chest or the fear of accusations of inappropriate touching or sexual assault.

Apply the AED Pads

Try to apply the pads within 30 seconds after the AED arrives. 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.

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.

If the AED advises a shock, it will prompt you to clear the person again. Loudly say, “Everybody clear,” or something similar. Be certain that no one is touching the person.

For most AEDs, delivering a shock is done by pressing the shock button. 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 analyze the heart rhythm again.

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.

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. Check your AED at fda.gov and navigate to Medical Devices > Products and Medical Procedures > Cardiovascular Devices > Automated External Defibrillators > Check Your AED and AED Accessories.

ADULT – ONE-PROVIDER CPR AED

One CPR provider can provide high-quality adult CPR by putting together all the skills of assessment, chest compressions, airway, breaths, and AED use. Follow the Procedure for Adult First Aid, CPR AED or the Procedure for Adult CPR AED. If the person is unresponsive and not breathing normally or only gasping, start high-quality CPR.

High-Quality CPR

Position the person on a firm, flat surface. Move any bulky clothing covering the chest out of the way. Position two hands on the lower half of the breastbone. Perform 30 high-quality chest compressions. 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.

Open the airway and use a CPR mask to give 2 breaths. Ensure each breath is 1 second in length and creates visible rise of the chest. Immediately resume high-quality chest compressions. Repeat CPR cycles of 30 compressions and 2 breaths for two minutes.

As soon as an AED is available, power on the AED. Follow the AED voice prompts. Correctly apply the AED pads. While the AED is analyzing, make sure no one is touching the person. If directed by the AED, deliver a shock. Be certain no one is touching the person. Press the shock button. Immediately resume CPR starting with chest compressions.

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

If another CPR provider arrives, take turns providing chest compressions. Switch providers about every two minutes, or sooner if they get tired. Try to minimize interruptions to compressions to less than 10 seconds.

ADULT – ADDITIONAL CPR AED CONSIDERATIONS

A CPR provider may face circumstances that require additional considerations or tasks for effective care.

AED Special Considerations

Act quickly if anything affects AED use to keep this link in the chain strong.

Minimize Interruptions

When a second CPR provider is available and the AED has not yet been applied, interruptions in chest compressions can be minimized if the second provider turns on the power to the AED and attaches the pads while the first CPR provider continues chest compressions.

Chest Hair

Thick chest hair may prevent AED pads from adhering to 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 (submerged) in water. The person must be removed from water before using an AED.

Wet Setting

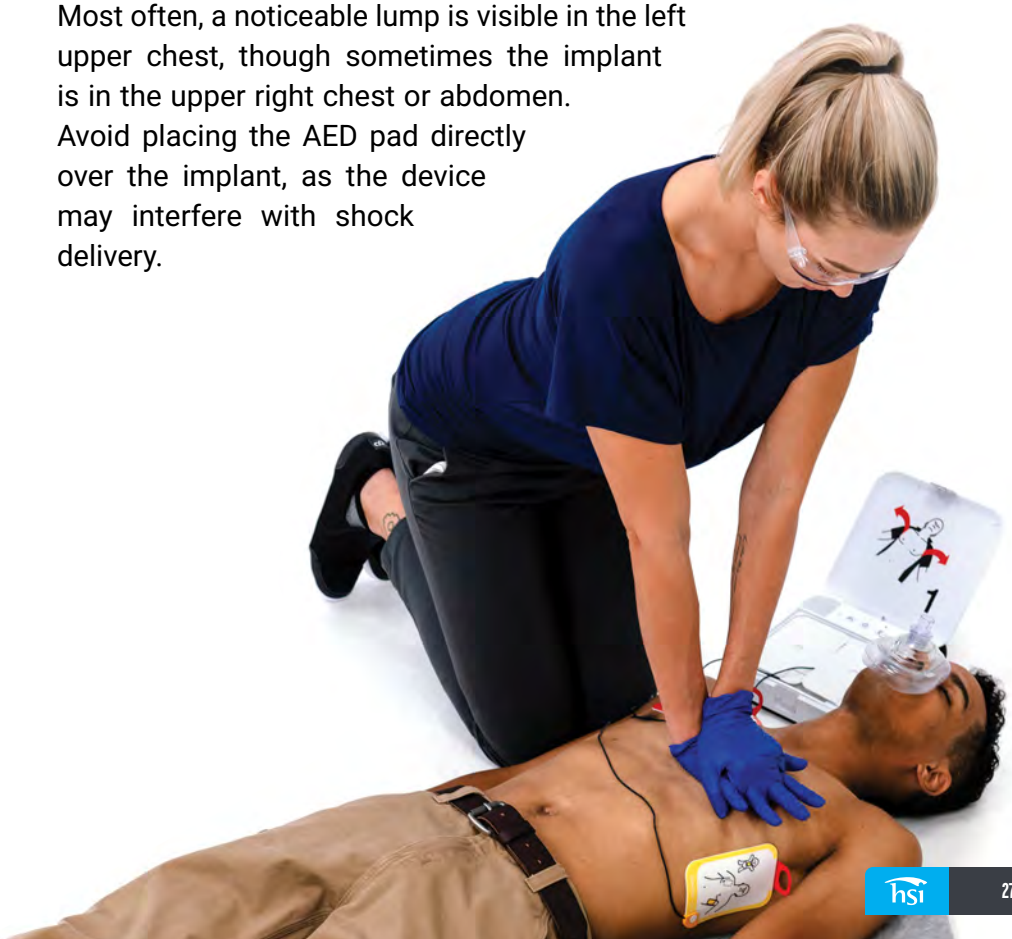
If the person is in a wet setting, such as lying on snow or ice, in rain, on a wet floor or deck, or in a small puddle, it is safe to use an AED. If the person's chest is wet, quickly dry the chest before applying pads.

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 Device

People who are 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.

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 them on their left side to improve blood flow.

Obesity

CPR providers should use the same techniques when the cardiac arrest victim is obese as they would for an average weight person.

Drowning

The immediate cause of death in drowning is a lack of oxygen. As they provide life-sustaining oxygen, giving breaths before chest compressions is emphasized.

As soon as the unresponsive adult is removed from the water, assess breathing for at least 5 seconds and no more than 10 seconds. If there is no breathing, open the airway and give 2 breaths that make the chest rise. [24] Continue CPR by providing cycles of 30 high-quality chest compressions and 2 breaths. Never delay CPR to get or apply an AED.

Medical Oxygen Administration Following Drowning

When it is available, properly trained CPR providers should administer medical oxygen to all persons in cardiac arrest following drowning. Never delay CPR to get, set up, or administer medical oxygen.

Take Standard Precautions

Resuscitation puts CPR providers at an increased risk of occupational exposure and infection from bloodborne and airborne pathogens.[25] CPR providers should routinely take standard precautions during resuscitation, including using a CPR mask with a HEPA filter when available.

Mouth-to-Mouth

There may be circumstances when a barrier device is not available, and a CPR provider is willing to provide mouth-to-mouth breaths. Mouth-to-mouth breaths can provide oxygen for a cardiac arrest victim.

To give mouth-to-mouth breaths 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 victim'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

Opioids are a class of natural, semi-synthetic, and synthetic drugs. These include both prescription medications used to treat pain and illegal drugs like heroin. Most overdose deaths in recent years involved illicitly manufactured fentanyl and other potent synthetic opioids.[26]

Opioids can cause death by slowing, and eventually stopping, breathing. Recognizing an opioid overdose can be difficult.

Signs of an overdose may include the following:

- Small, constricted, "pinpoint" pupils
- Changes in skin appearance and condition
- Falling asleep or loss of consciousness
- Slow, shallow breathing
- Choking or gurgling sounds
- 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 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 an opioid reversal medication containing naloxone. To use Narcan Nasal Spray, peel back the package to remove the device. Lay the person on their back. Hold the device with your thumb on the bottom of the red plunger and your first and middle fingers on either side of the nozzle.

Tilt the person's head back and provide support under the neck with your hand. Gently insert the tip of the nozzle into one nostril until your fingers on either side of the nozzle are against the bottom of the person's nose. Press the red plunger firmly to give the dose of NARCAN Nasal Spray.[27]

If the person does not respond by waking up to voice or touch, or start breathing normally, another dose may be given in the same way. NARCAN Nasal Spray may be given every 2 to 3 minutes, if available.

Suspected Opioid-Associated Emergency

If you suspect an opioid-associated emergency, begin with assessment. Avoid contact with drug residue, containers, needles, and other paraphernalia.

If the unresponsive person is not breathing normally or only gasping, immediately start CPR, beginning with chest compressions. Use an 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 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 takes over or EMS arrives.

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.[28]

ADULT – RELIEF OF CHOKING

Choking, also known as foreign-body airway obstruction (FBAO), 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.

To provide the appropriate care, you must be able to recognize the difference between a mild and severe airway obstruction.

Mild 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.

Signs of 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 their throat.

Follow the Procedure for Adult and Child Foreign-Body Airway Obstruction. Begin with assessment.

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 activate EMS and/or your EAP. Send someone to get a first aid kit and an AED.

Give Back Blows

To give back blows, stand to the side and just behind a choking adult. Place one arm diagonally across the person’s chest to support their body. Bend the person over at the waist to face the ground.

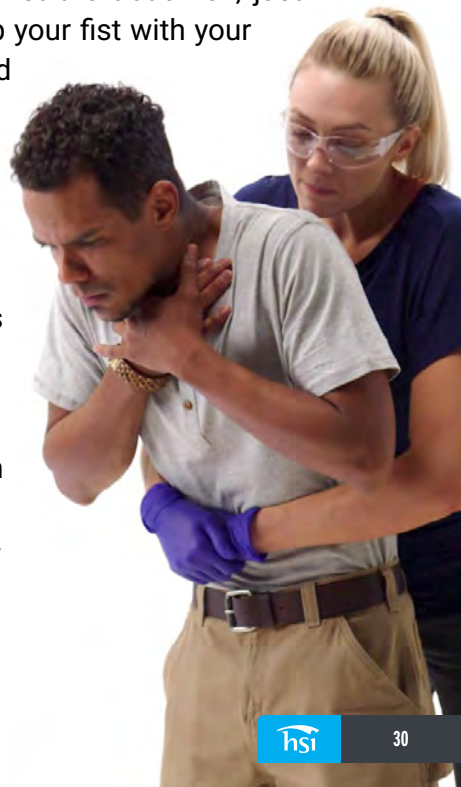
Give 5 forceful back blows between the person’s shoulder blades with the heel of your hand. Give each back blow forcefully with the intent of dislodging and expelling the object.

If 5 back blows do not dislodge the object, follow with 5 abdominal thrusts.

Give Abdominal Thrusts

To give abdominal thrusts, stand behind the person. If possible, take a staggered stance with one foot in between the person’s feet and the other foot slightly behind you for balance. Locate the person’s navel.

Make a fist and place it thumb-side against the abdomen, just above the navel and below the ribs. Grasp your fist with your other hand. 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 the cycle of 5 back blows followed by 5 abdominal thrusts until the person can breathe normally or becomes unresponsive.

If Successful

If the object is expelled and the person can inhale and exhale again, encourage the person to be seen by a healthcare professional. Though infrequent, serious complications from abdominal thrusts can occur.

Chest Thrusts

If you have given 5 back blows, but you cannot wrap your arms around the person to give abdominal thrusts because they are pregnant, in a wheelchair, or too large for you, use chest thrusts instead.

To give chest thrusts, reach under the person's 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 not to put pressure on the ribs. Give each chest thrust forcefully with the intent of dislodging and expelling the object.

If chest thrusts do not dislodge the object, repeat the series of 5 back blows and 5 chest thrusts until the object is expelled and the person can breathe, or the person becomes unresponsive.

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.

If the Person Becomes Unresponsive

If the person becomes unresponsive, carefully lower them to a firm, flat surface.

If you are alone and have not done so already, activate EMS and/or your EAP.

Conventional CPR

If you are trained in conventional CPR with breaths, immediately start high-quality CPR beginning with chest compressions. Before opening the airway to provide breaths, open the person's mouth wide. If you see an object, remove it by sweeping it out with your fingers.

Do not stick your finger blindly in a person's throat and attempt to sweep out an object. This can cause injury or push the object further down the throat, worsening the obstruction.

Tilt the head and lift the chin to open the airway. Use a CPR mask and give 2 breaths. Immediately resume high-quality chest compressions.

Continue performing CPR cycles of 30 compressions and 2 breaths. Check for an object in the person's mouth before each set of 2 breaths. If you see an object, remove it by sweeping it out with your fingers.

Compression-Only CPR

If untrained, unwilling, or unable to provide breaths, begin compression-only CPR immediately after activating EMS and/or your EAP, because it is better than no CPR.

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.

Choking While Alone[29]

If you are having a choking emergency, are unable to speak or cough and are alone, call 911 to activate EMS using a mobile device if possible. Even if you cannot speak, dialing 911 and leaving the line open will allow dispatchers to trace your call and send help.

Quickly perform self-administered abdominal thrusts. Use your fist, placed thumb-side against your abdomen. Grasp your fist with your other hand. Give 5 inward and upward thrusts.

Alternatively, use a stationary object such as the back of a chair to give yourself abdominal thrusts.

SECTION THREE

ADULT FIRST AID LESSONS

EXTERNAL BLEEDING

External bleeding occurs when injury causes blood to flow out of the body through an open wound. Blood clotting normally occurs when there is damage to a blood vessel. But sometimes bleeding requires external bleeding control, a fundamental first aid skill.

Application of direct manual pressure is the key part of the skill. Direct pressure stops bleeding by compressing the bleeding blood vessel.

Non-Severe External Bleeding

Non-severe external bleeding typically stops on its own, but if not, apply direct manual pressure with gloved hands, a sterile dressing, or any available clean material for at least five minutes. The bleeding should stop or slow to an ooze or trickle.

Once the bleeding stops, wrap an elastic or self-adhesive roller bandage firmly over the gauze or other material to help maintain pressure. Start at the point furthest away from the body, wrapping in a spiral motion toward the core of the body.

Severe or Life-Threatening External Bleeding

Trauma is the Greek word for "wound."[30] 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.[31]

Severe or life-threatening external 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 or life-threatening external 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 or life-threatening if blood is gushing or spurting, flows continuously despite direct manual pressure, or when there is about half a soda can's worth of blood on the ground or pooling on a surface.

Other signs and symptoms of severe or life-threatening external bleeding include drowsiness, dizziness, chest pain, or loss of consciousness.

To stop severe or life-threatening bleeding, apply direct manual pressure over the wound.

Bleeding Control Materials

Bleeding control materials can improve the effectiveness of direct pressure or help to maintain it.

Bleeding Control Kit

It is a best practice to have bleeding control materials readily available in a bleeding control kit. In some public places, a wall mounted bleeding control kit is next to an AED.

A bleeding control kit can make it easier for a first aid provider or immediate responder to locate bleeding control materials quickly in a life-threatening emergency.

The contents of a bleeding control kit vary but typically contain

disposable gloves; at least one manufactured, ready-made tourniquet; 4" x 4" gauze sponges; a gauze roll; hemostatic dressings; trauma shears that are designed to cut through clothing; and an instruction card for proper use of the kit contents.

First Aid Kit

If no bleeding control kit is available, there may be a first aid kit.

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. [32]

Improvised Bleeding Control Materials

If sterile dressings or other bleeding control materials from a bleeding control kit or first aid kit are not immediately available, use any clean material such as clothing, a towel, other absorbent materials, or apply direct manual pressure directly over the wound with gloved hands until a bleeding control kit or first aid kit arrives.

Direct Manual Pressure

When severe or life-threatening external bleeding occurs, your immediate response is to apply direct manual pressure, using the bleeding control materials that are readily available to you. Direct manual pressure can be applied anywhere on the body.

Follow the Procedure for Severe or Life-Threatening External Bleeding Control. Begin with assessment.

If the person is responsive and breathing, introduce yourself and ask, “May I help you?” Find the source of the bleeding. Open, lift away, or remove clothing covering the wound so you can clearly see it.

If only some bleeding control materials are readily available, like those from a first aid kit, apply direct manual pressure on the wound with sterile trauma dressings, compressed gauze, or a stack of 10 sterile 4" x 4" gauze sponges. If sterile dressings are not available, use any clean material available. If there is no clean material available, apply direct manual pressure without a dressing.

Direct manual pressure over the wound 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 straight down, with the shoulders directly over the hands and elbows locked.

Push down hard onto the wound, even if it is painful to the injured person. 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.

Keep pressing hard until the bleeding stops, someone takes over for you, or the scene becomes unsafe.

Be aware that fatigue may occur and can affect the quality of direct manual pressure.[33]

Once the bleeding is controlled, wrap a bandage tightly over the dressing to hold it in place.

When severe or life-threatening external bleeding is present and additional bleeding control materials like tourniquets and hemostatic dressings are readily available, like those from a bleeding control kit or some workplace first aid kits, use the manufactured tourniquet, hemostatic dressing, or wound-packing materials depending on where the wound is located.

Wound Packing with Direct Manual Pressure

Find the source of bleeding. When there is severe or life-threatening bleeding from the neck, shoulder, or groin, apply direct pressure with a hemostatic dressing.

A hemostatic dressing is a sterile gauze dressing impregnated with an ingredient that causes rapid clotting of blood. Hemostatic dressings more rapidly control bleeding than use of direct manual pressure alone.[34]

You may need to pack, or stuff, a hemostatic dressing or other wound-packing materials into the wound to stop bleeding.

Pack the hemostatic 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, someone takes over for you, or the scene becomes unsafe.

If a hemostatic dressing is not available, use sterile gauze or any clean material to pack the wound and apply direct pressure.

Manufactured Tourniquet

When available, a manufactured tourniquet should be used for life-threatening extremity bleeding and should be applied 2–3 inches above the bleeding site as soon as possible after the injury and be tightened until bleeding stops.

A manufactured tourniquet is a wide band placed around an arm or a leg and tightened to compress blood vessels and stop bleeding.

Follow the tourniquet manufacturer's instructions. The basic steps are as follows: place the tourniquet, turn the windlass, secure the windlass, and document.

- **Place:** Find the bleeding source. 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 or operate the rachet and keep turning it until the bleeding stops. Tell the person to expect pain. Getting the tourniquet right means getting the tourniquet tight. [35] A tourniquet will cause pain, but it is necessary to stop life-threatening bleeding.
- **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 in a noticeable spot on the injured person, such as on their skin near the tourniquet or other exposed area, like the forehead or cheek. Once you have applied a tourniquet, do not loosen or remove it.

If bleeding is not stopped with the first tourniquet, and a second one is available, it can be applied side by side, above the first. Offset the windlass placement of the second tourniquet so that you can turn it without snagging on the first tourniquet.

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, use an improvised tourniquet if you have trained and practiced in its correct use.

An improvised tourniquet can be created using common materials such as a triangular bandage or clothing and a rigid stick-like object for twisting as a windlass. The windlass must be hard, strong, and capable of withstanding the twisting force placed on it without bending or breaking.[36] A correctly improvised windlass tourniquet can be as effective as a manufactured device.[37,38] However without a windlass, improvised tourniquets will not stop bleeding.[39]

- 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 under the limb, 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 the rigid stick-like object on top of the half-knot and tie a full knot over it.
- Twist the object and keep twisting until the bleeding completely stops. Use the free ends of the knot to tie the windlass securely so it does not unwind.
- Document the time that the tourniquet was applied. Once you have applied a tourniquet, do not loosen or remove it.

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's tissues and cells are not receiving an adequate supply of blood flow and oxygen 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 from shock will die from it.[40]

In addition to severe bleeding, shock can result from heart problems, allergic reactions, infections, and damage to the nervous system, such as a spinal cord injury.

Follow the Procedure for Adult First Aid. Begin with assessment.

Early signs 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.

Calm, comfort, and reassure the person. Stay with them.

INTERNAL BLEEDING

Internal bleeding can result when the body suffers significant force. External bleeding is easy to recognize. Internal bleeding can be more difficult.

Suspect internal bleeding after any significant physical injury. For example, when a person is struck by a moving vehicle or equipment, fell from a height, or was stabbed or shot.

As internal bleeding continues, signs and symptoms appear and steadily get worse. Signs and symptoms include swelling, tenderness, or pain in the injured area, coughing up or vomiting blood, and signs of shock.

Follow the Procedure for Adult First Aid. Begin with assessment.

If the person shows signs of shock, and there is no difficulty breathing, keep them lying down, face up.

Continue to follow the Procedure for Adult First Aid. 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.

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. These 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).[41]

AMPUTATION

Amputation is the complete detachment of a body part. Follow the Procedure for Adult First Aid. Begin with assessment.

Bleeding may be minimal or severe depending on the location and nature of the injury. Control minimal bleeding with continuous direct manual pressure for at least five minutes. Use a sterile dressing or any clean available material. When life-threatening bleeding is present, follow the Procedure for Severe or Life-Threatening External Bleeding.

Amputated body parts can often be surgically reattached. Save any severed body parts and make sure they stay with the person. If possible, remove any dirty material and gently rinse the amputated part if the cut end is dirty.[42] 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, and 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.

IMPALED OBJECTS

An impaled object is a foreign body that has punctured the skin and is embedded in the body.

Follow the Procedure for Adult First Aid. Begin with assessment.

In general, do not remove an impaled object. If it has damaged any large blood vessels, it can act like a plug, helping to prevent severe, life-threatening bleeding. However, if an impaled object is causing total airway obstruction, remove the object.

If necessary and with consent, remove or cut away clothing to get a better look at the injury. Place sterile bulky dressings around 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, if possible, 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]).[43]

OPEN CHEST WOUND

A penetrating injury through the chest wall, such as those caused by a knife or bullet, is immediately life-threatening as the chest contains the heart, lungs, and other vital organs.

Follow the Procedure for Adult First Aid. Begin with assessment.

Open, lift away, or remove clothing so you can clearly see the chest and back, as a penetrating injury may cause both an entry wound and an exit wound. You may hear a gurgling sound as the person breathes in. You may see bubbling blood around the wound. The person may show signs of shock and get worse quickly.

Any dressing or material placed over an opening in the chest wall has the potential to trap air between the lung and chest wall. The building pressure in the chest can quickly impair breathing. Some bleeding control kits include specialized dressings called vented chest seals for treating open chest wounds. These prevent air from entering the chest cavity through the wound but also allow trapped air to safely escape. Unless you have training in the use of vented chest seals, it is okay to leave an open chest wound exposed, without a dressing.

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

Safety & Health Tip

Nail guns are powerful, easy to operate, and boost productivity for nailing tasks. They are also responsible for an estimated 37,000 emergency room visits each year. Severe nail gun injuries have led to construction worker deaths. [44]

OPEN ABDOMINAL INJURY

Some penetrating injuries to the abdomen may cause the abdominal organs to protrude or spill out of the body.

Follow the Procedure for Adult First Aid. Begin with assessment.

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 whatever position is of greatest comfort to them, which is often 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.

Active Violence Events

Trained providers should not touch, move, or alter potential evidence at a crime scene, such as weapons or shell casings, unless absolutely necessary to safely provide life-saving care to the injured person.

HEAD, NECK, OR SPINAL INJURY

The leading cause of head, neck, and spinal injuries are falls, followed by being struck by a motor vehicle, motor vehicle crashes, violence, and terrorism.[45]

Signs and symptoms of a spinal column or cord injury include the following:[46]

- Numbness, tingling, or a loss of sensation in hands and feet
- Paralysis
- Pain or pressure in the head, neck, or back
- Weakness in any part of the body
- Unnatural or uncomfortable positions of the spine or head
- Loss of bladder and bowel control
- Problems with walking
- Difficulty breathing

If you suspect an injured person has a spinal injury, follow the Procedure for Adult First Aid. Begin with assessment.

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. Unstable spinal column injuries can progress to severe nervous system injuries with excessive movement.[47]

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.

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.

EYE INJURIES

For a person who receives an eye injury from high-speed force, such as drilling, grinding, or nailing, follow the Procedure for Adult First Aid. Begin with assessment.

Do not remove any objects that are stuck in the eye. Do not rinse the eye and do not allow the person to rub or apply pressure to the eye. Never apply a pressure dressing to an eye.

Gently place an eye shield over the injured eye. Ensure that the edges rest comfortably on the bones around the eye and not on the eye itself. Use first aid tape to hold the shield in place. If an eye shield is not available, the bottom of a paper cup taped to the bones around the eye can also serve as a shield.[48]

Place a shield on only one eye, unless both eyes are injured. Movement in the uninjured eye does not typically worsen the injured eye's condition. Placing shields over both eyes unnecessarily eliminates the person's ability to see and is psychologically stressful.[49]

For a foreign body in the eye from a low-speed force such as dust or dirt blown into the eye by wind, the person should allow their natural tears to wash the object out, or they may flush the eye with tap water or a commercial eye wash solution.

Safety & Health Tip

According to the American Academy of Ophthalmology, wearing proper protective eyewear can prevent 90% of eye injuries.[50]

BURNS

A burn is an injury to skin surface and possibly the deeper layers, caused by flames, hot liquids, hot surfaces, hot gases, caustic chemicals, or electricity. Burns can also be caused by exposure to radiant heat such as intense sunlight or certain industrial machinery like ovens, furnaces, and kilns.

Superficial or First-Degree Thermal Burns

Superficial or first-degree burns are characterized by skin redness and pain without blistering or other damage to the skin surface.

Superficial thermal burns should be cooled immediately with cool, clean running water. As burned tissue swells, remove jewelry to prevent constriction. Continue cooling for 5–20 minutes. Cooling reduces pain, swelling, and depth of injury.

If cool, clean running water is not available, and the skin is intact, cool superficial burns with ice wrapped in cloth. Limit application of ice to 10 minutes to prevent frostbite.

After cooling, loosely cover the burn with a dry, non-stick sterile or clean dressing.

Safety & Health Tip

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

Partial-Thickness or Second-Degree Thermal Burns

Partial-thickness or second-degree burns damage the skin surface and injure the skin's deeper layer. They are painful burns with redness, swelling, and blisters. Leave blisters intact as it improves healing and reduces pain.

Severe or Third-Degree Thermal Burns

Full-thickness or third-degree burns destroy all layers of the skin. They appear white and leathery with charred skin. There is no sensation in the area since the nerve endings are destroyed.

For severe thermal burns, or if there is evidence of smoke inhalation injury, such as facial burns, difficulty breathing, singed nasal hairs, or soot around the nose or mouth, follow the Procedure for Adult First Aid. Begin with assessment.

Stop, Drop, Roll

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.

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.

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.

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, follow the Procedure for Adult First Aid. Begin with assessment.

An electric shock can cause cardiac arrest. If the person is unresponsive and not breathing normally or only gasping, start CPR.

When a body part comes into contact with an exposed electrical source, electricity can travel from the point of contact through the person's body and 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.

Chemical Burns

A caustic chemical is a highly corrosive substance that damages living tissue. The severity of a caustic chemical burn depends on the type and concentration of the chemical, the amount the person is exposed to, the body site involved, how long the exposure lasts, and how deeply it penetrates the skin.

Follow the Procedure for Adult First Aid. Begin with assessment. Rapid removal of the caustic substance is crucial to limit damage to the skin. Certain chemical powders become highly corrosive when mixed with water and can burn or destroy skin. Brush off any chemical powder before immediately flooding the affected area with running water for 15 minutes.

Quickly remove contaminated clothing and jewelry. Be careful not to contaminate yourself or other people. If it is still painful after flushing for 15 minutes, continue flushing.

In workplaces with potentially harmful chemicals or materials, use the safety shower.

In workplaces with hazardous chemicals, use the safety shower. Quickly take off all contaminated clothing, jewelry, and shoes while under the shower. Stay under the water for at least 15 minutes to flush corrosive or toxic substances off the person's skin.

Chemical Eye Burns

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.

⚠ 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 SDS for their exposed workers, and train them to handle the chemicals appropriately.[51] *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.*

BONE, JOINT & MUSCLE INJURIES

Bones, muscles, and joints give the body shape, allow movement, and protect vital internal organs. Sprains, strains and fractures are injuries that affect bones, muscles, ligaments, tendons, and joints.

- Strains are stretching or tearing injuries to muscles or tendons.
- Sprains are tearing injuries to ligaments that hold joints together.
- Fractures are breaks in bones.

Sprains and Strains

Signs and symptoms of sprains and strains include pain, swelling, and limited ability to move the affected limb or joint.

To care for strains and sprains, rest and limit use of the injured limb.

Application of cold 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 20–30 minutes, 3 to 4 times daily. Place a barrier, such as a thin towel, between the plastic bag and the skin.

Applying a compression wrap to an ankle sprain may provide comfort and help relieve pain. Be careful not to impair circulation by tightening the compression wrap too much. Always apply from the lowest part of the foot to mid-calf.

Fractures

Fractures are extremely painful injuries that can become life-or limb-threatening when involving long bones, major blood vessels, or open wounds.

Signs and symptoms of fractures include obvious deformity, swelling, or bruising of a limb; severe pain with movement or inability to move the limb; or a visible bone protruding from an open wound.

If you suspect a fracture, follow the Procedure for Adult First Aid. Begin with assessment.

If a fracture has an open wound and severe bleeding, follow the Procedure for Severe or Life-Threatening External Bleeding Control.

It is best to not straighten an injured limb that is unnaturally angled. Leave it in the position found. 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.

Safety & Health Tip

Slips, trips, and falls are a leading cause of workplace fatalities and injuries, resulting in 844, or roughly 15% of all fatal work injuries in 2024, according to the U.S. Bureau of Labor Statistics.[52] Here are some prevention 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.

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.

In more populated, complex, or high-risk workplaces, first aid kits are required to include a malleable splint. This splint is a compact, lightweight 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. Follow the manufacturer's instructions.

- Shape a properly sized malleable splint to match the contours of the injured limb.
- Place the splint to immobilize the injury site and the joints above and below.
- Secure the splint to the limb using tape, self-adhesive roller or elastic bandages, or plastic cling film.
- Be careful not to impair circulation. Monitor for signs of poor circulation, like coolness, discoloration, pain, or numbness.

Improvised Splints

Splints can be improvised with commonly available items:

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

To apply an improvised splint, 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

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.

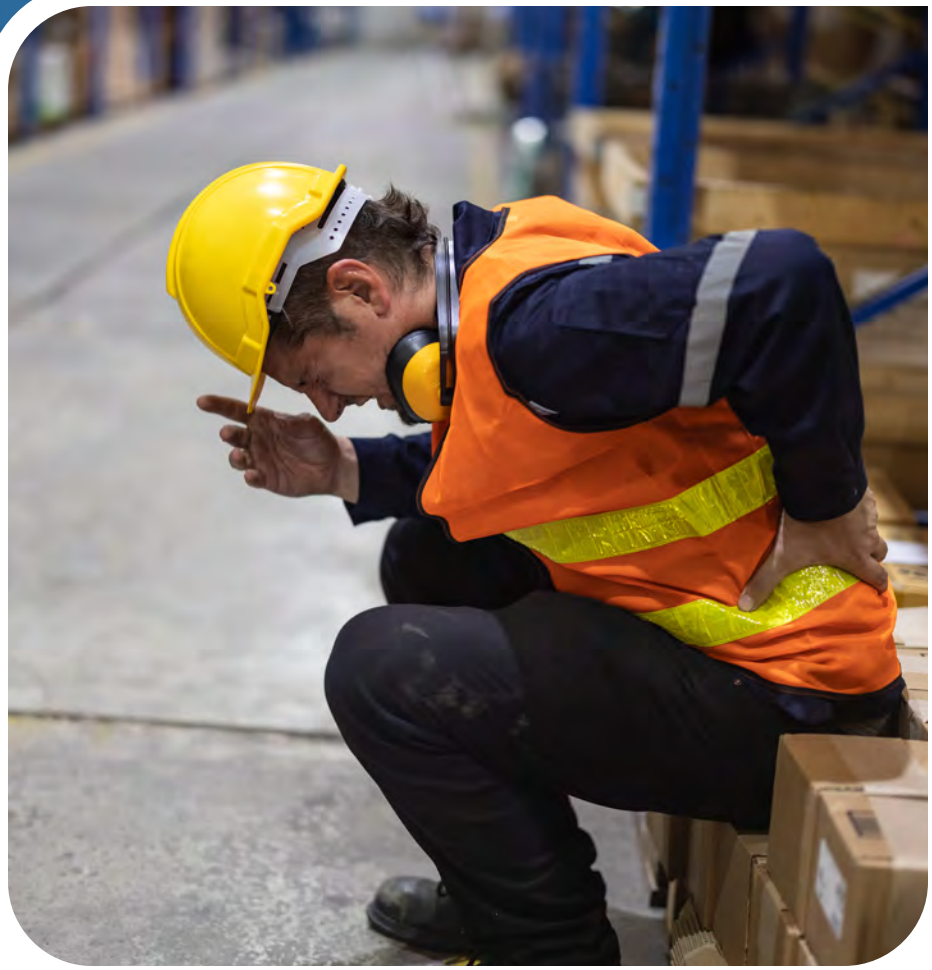
REPETITIVE STRESS INJURIES

Musculoskeletal disorders (MSDs) are injuries or conditions affecting the body's movement system, including muscles, nerves, blood vessels, ligaments, and tendons. According to the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA), work-related MSDs are among the most frequently reported causes of lost or restricted work time.

MSDs occur from lifting heavy items, bending, reaching overhead, pushing and pulling heavy loads, working in awkward body postures, or performing the same or similar tasks repetitively. Work related MSDs can be substantially reduced or prevented by applying ergonomic principles in the workplace. These are guidelines for designing work, tasks, tools, and environments to fit the job to a worker, optimizing their comfort, safety, and efficiency while reducing strain.

Many repetitive stress injuries can be prevented by:

- Learning the principles of ergonomics.
- Learning about the proper use of equipment, tools, and machine controls.
- Using good work practices, including proper lifting techniques.
- Taking short, frequent rest breaks.
- Using a workstation that allows for standing, sitting, or sitting-standing positions.
- Using appropriate tools and equipment to reduce the force needed to complete tasks.
- Recognizing early signs and symptoms of MSDs, such as pain, aching, and tiredness of the affected limb; reporting them to your employer; and following up with a health care professional.[53,54]



CONCUSSION

A concussion is a type of mild traumatic brain injury that is caused by an action or injury that rapidly moves the head and brain back and forth. Falls are the most common cause of concussions. Concussions are also common among athletes who play contact sports, such as football or soccer.[55]

Signs and symptoms of concussions include headache, nausea, impaired balance, difficulty concentrating, confusion, heightened irritability or temper, and fatigue.

If you suspect a person may have a concussion, have the person stop any activity. The person should be evaluated and cleared by a qualified medical professional before allowed to participate in any physical activity.

Signs or symptoms of severe head injury include loss of consciousness, worsening headache, vomiting, altered mental status, seizures, visual changes, swelling, or deformities of the scalp,

Follow the Adult First Aid procedure. Begin with assessment.

Calm, comfort, and reassure the person. Stay with them until someone with more advanced training takes over or EMS arrives. If the person becomes unresponsive, be prepared to give CPR and use the AED if one is available.

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.

MINOR WOUNDS

Superficial wounds occur when the topmost layer of skin, the epidermis, is damaged. Proper first aid care can prevent infection, speed healing, and reduce scarring. Superficial wounds of the skin surface should be thoroughly flushed with running tap water or sterile saline solution until there is no foreign matter in the wound.

Wounds heal better, with less infection, if they are covered with a clean occlusive dressing. An occlusive dressing is an air- and water-tight dressing with a waxy coating to seal off the wound and surrounding tissue from air or contaminants. If the wound develops redness, swelling, foul-smelling drainage, increased pain, or fever, remove the dressing, inspect the wound, and obtain medical care.

TOOTH INJURIES

A blow to the mouth can break, loosen, or even knock out teeth. Follow the Procedure for Adult First Aid. Begin with assessment. If a tooth is loose, have the person gently bite down on a folded sterile gauze pad to keep the tooth in place. If sterile gauze is not immediately available, a small t-shirt or cloth can be used. Contact a dental professional as soon as possible.

Knocked-Out Tooth

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. Do not touch the root of the tooth, only the chewing surface, called the crown. If the tooth is covered in dirt or debris, gently rinse for 10 seconds or less. Use only water, not soap or other chemicals. Do not scrub or wipe the tooth surface in any way. Don't dry the tooth, don't wrap it in a tissue or cloth, and do not store it in tap water.

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.[56] Alternatively, the tooth can be held in place with gentle biting pressure over a gauze pad, small towel, or tissue.

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.

If none of those solutions or materials are available, store the tooth in probiotic yogurt, egg white, almond milk, or another person's saliva.

Act quickly, within 30 minutes. Get the person to the nearest dentist or endodontist. The faster you act, the better the chance of saving the tooth. Time to professional dental care is the most important factor after a tooth is knocked out.

Safety & Health Tip

Mouth guard use has been shown to reduce the risk of sport-related dental injuries.[57]

BLEEDING FROM THE NOSE

To care for someone with a nosebleed, have them sit with their head slightly forward and pinch their nostrils closed for 10-15 minutes. This is the only care necessary in most cases.

Leaning forward helps keep blood from entering the airway, which can lead to trouble breathing, and vomiting. Instruct the person to breathe through their mouth and spit out any blood.

If the bleeding does not stop after 15 minutes of pinching the nostrils closed, or the person becomes lightheaded, call 911 to activate EMS using a mobile device and/or activate your EAP.

MENTAL HEALTH CRISIS

Mental health includes our emotional, psychological, and social well-being. Mental illnesses are disorders, ranging from mild to severe, that affect a person's thinking, mood, and/or behavior. Mental illnesses are common. According to the National Institute of Mental Health, nearly one in five adults in the United States live with a mental illness. A mental health crisis is defined as "any situation in which a person's behavior puts them at risk of hurting themselves or others or prevents them from meeting their basic survival needs in such a way that their safety is at risk."[58,59,60,61]

Call or text the
National Mental Health Hotline
988
to connect with a Lifeline counselor
for free and confidential
emotional support.

Warning Signs of a Mental Health Crisis

- Rapid mood swings, increased energy level, inability to stay still, pacing
- Suddenly depressed, withdrawn; suddenly happy or calm
- Increased agitation, verbal threats; violent, out-of-control behavior; property destruction
- Abusive behavior to self and others, including substance misuse or self-harm
- Losing touch with reality
- Confused, strange ideas
- Hearing voices or seeing things that aren't there
- Talk of suicide or harming others

What to Do If You Suspect a Mental Health Crisis

- Follow the Procedure for Adult First Aid. Begin with assessment. If the person is violent, suicidal, or the scene is unsafe, do not approach. Activate EMS and/or your EAP.
- Remain calm and use an even tone of voice. Give the person space.
- Obtain consent. Introduce yourself and ask, "May I help you?"
- Assess for life-threatening conditions. If present, and with consent, provide appropriate first aid.
- If there are no weapons, serious injuries, or elements of violence, suggest the person call or text the National Mental Health Hotline (988) to connect with a Lifeline counselor for free and confidential emotional support.
- Calm, comfort, and reassure the person. If you feel safe, stay with them until someone with more advanced training takes over or EMS arrives.

ALTERED MENTAL STATUS

A person who has a normal level of consciousness is alert and aware of what is happening.

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 Procedure for Adult First Aid. Begin with assessment.

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.

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.

Recognition of the signs and symptoms of near fainting combined with rapid first aid treatment may prevent fainting. 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.

Safety & Health Tip

Injuries due to syncope are frequent. The risk of major injuries is substantial. Older persons are at higher risk.[62]

Physical Counter-Pressure Maneuvers (PCMs)

Once in a safe position, encourage the person to perform physical counterpressure maneuvers (PCMs). PCMs are movements of a group of muscles that increase blood pressure. PCMs can relieve the symptoms of near fainting and prevent injuries from fainting.

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 near fainting, instruct the person in these movements.

- Cross the legs and tense the muscles of the legs, abdomen, and buttocks. Get into a squatting position and tense the leg and abdomen muscles.
- Hook the fingers of both hands and pull outward in opposing directions as hard as comfortably possible.
- Clench both fists as hard as comfortably possible, holding a soft object if one is nearby.
- Bring the chin down to the chest and tighten the muscles in the neck.

PCMs can also be used for self-care if you feel faint.

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. If the person's symptoms do not improve within 1–2 minutes, worsen, or reoccur, call 911 to activate EMS and/or your EAP.

Fainting

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.

When responding to a person who fainted, follow the Procedure for Adult First Aid. Begin with assessment. After fainting, a person should quickly regain consciousness. If there is no evidence of pain or injury, place them flat on their back. Consider raising their feet about 6–12 inches. If an unresponsive person is breathing normally, place them on their side in the recovery position to help protect the airway.

Regularly reassess scene safety, responsiveness, breathing, and the effectiveness of first aid care provided.

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. 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 Procedure for Adult First Aid. Begin with assessment.

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

Face: Ask the person to smile. Does one side of the face droop?

Arms: Ask the person to raise both arms. Does one arm drift downward?

Speech: Ask the person to repeat a simple phrase. Is the speech slurred or strange?

Time: If you see any of these signs, it is time to activate EMS and/or your EAP.

- 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.
- As there is no clear benefit, **do not** give medical oxygen to a person with a suspected stroke.

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.[63]

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 and symptoms of low blood sugar include dizziness, fatigue, a fast heart rate, shakiness, confusion, and slurred speech. Low blood sugar can lead to unconsciousness and seizures.

Follow the Procedure for Adult First Aid. Begin with assessment.

If they can swallow without difficulty, encourage them to swallow about 20 grams (about 1¼ U.S. tablespoons) of oral glucose. Oral glucose refers to various forms of simple sugars taken by mouth. Oral glucose comes in different forms, including a dissolved solution, gel, spray, chewable tablets, or a wet paste. If not available, use something with 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.

Call 911 to activate EMS using a mobile device and/or activate your EAP if the person is unable to swallow, has a seizure, or does not improve within 10 minutes of taking oral glucose. Do not give oral glucose to a person who is not able to swallow or is 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.[64]

SEIZURE

Seizures are triggered by excessive electrical activity within the brain. Seizures can occur because of infections, injury, poisonings, lack of oxygen, and low blood sugar as well as conditions such as epilepsy.

Focal Seizures

Some seizures, called focal seizures, affect only one area of the brain. Signs include:

- Acting confused or staring into space.
- Jerking of one limb or one side of the body.
- Abnormal facial movements or small repetitive movements.

If the person appears to be having a focal seizure, and is falling, help ease them to the ground. Place them in the recovery position and stay with them until they are awake and alert.

Generalized Seizures

Generalized seizures affect both sides of the brain. Signs include:

- Loss of consciousness.
- Weak or limp, or tense, rigid muscles.
- Sustained rhythmical jerking movements of the whole body.
- Repeated extension and flexion of the whole body.[65]

During a generalized seizure, it may look like the person has stopped breathing when chest muscles tighten. Giving breaths is generally not needed.[66]

Follow the Procedure for Adult First Aid. Begin with assessment.

Call 911 to activate EMS using a mobile device and/or activate your EAP if any of the following occurs:

- It is a first-time seizure.
- The seizure lasts longer than 5 minutes.
- The person has repeated seizures.
- The person has difficulty breathing.

- The seizure occurs in water.
- The person is injured, pregnant, or sick.
- The person does not return to their usual state within 5 to 10 minutes after the seizure has stopped.

Time the seizure from beginning to end. This can help you determine if emergency help is needed. Remain calm. Most seizures only last a few minutes.

Protect the person from injury during the seizure. Move objects away that they may bump in to.

If necessary, loosen tight clothes around the neck and put something small and soft under their head.

Do not put anything in the person's mouth, including your fingers. It's physically impossible for someone to swallow their tongue. Don't give them water, pills, or food.

Safety & Health Tip

Traumatic brain injuries are a frequent cause of epilepsy. To help prevent traumatic brain injuries, use a seat belt when in a vehicle 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.[67]

After-Seizure Care

Place the person in the recovery position to help protect the airway from vomit or fluids until the person is awake and responsive.

Be sensitive and supportive. Ask others to do the same. It is common after a seizure for the person to exhibit fear, confusion, and agitation. Do not restrain the person when they are confused, as they may respond aggressively.

Stay with them until they are awake and alert. Reassure the person that you are there to help.

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 choking.

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.

Follow the Procedure for Adult First Aid. Begin with assessment.

Allow the person to find the most comfortable position in which to breathe, typically sitting up. 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 and use an AED, if available.

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 device called a metered-dose inhaler, with or without a spacer, to deliver quick-relief medication to help control symptoms. Occasionally, due to the degree of difficulty breathing, the person may need help assembling and using the inhaler.

Allow the person to find the most comfortable position in which to breathe, typically sitting up and leaning forward. With consent, help them loosen any restrictive clothing. Help the person assemble and use the 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.

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

Hold the inhaler with the mouthpiece down. Have the person 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 the person keep breathing in as slowly and deeply as they can.

Have the person 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.

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. When used with an inhaler, spacers improve the delivery of the medication to the lungs.

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.

Improvised Spacer

If a commercially available spacer is not available, an improvised spacer can be used.

Call 911 to activate EMS using a mobile device and/or activate your EAP and get the first aid kit and an 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.

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 allergic reaction include bee stings, peanuts, latex, seafood, and penicillin. A severe allergic reaction may also be exercise-induced or develop without an external or known cause.

When a severe allergic reaction 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. Symptoms of anaphylaxis may also include shock or asthma.

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.

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.[68] *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.*

Follow the Procedure for Adult First Aid. Begin with assessment.

A person with a history of allergic reactions may carry epinephrine, a medicine prescribed to them to treat severe allergic emergencies. Epinephrine for emergency use is available in a medical device such as a nasal spray or autoinjector. There are different manufacturers and trade names, but all contain a standard dose of epinephrine. Epinephrine can quickly reverse the effects of severe allergic reaction and may be lifesaving.

Individual state laws and regulations may allow first aid providers to obtain and administer epinephrine for a person experiencing a severe allergic reaction, but may also prescribe specific practices, rules, and standards for epinephrine administration.

Using Epinephrine Nasal Spray[69]

An epinephrine nasal spray device contains a single dose for use in either nostril. It is used to treat severe allergic reaction in adults and children who weigh 66 pounds or more.

A first aid provider should help a person experiencing a severe allergic reaction to use their nasal spray if assistance is required. If a person is unable to self-administer the nasal spray, the first aid provider may be able to do it for them.

Remove the device from its packaging. Hold the device with your thumb on the bottom of the plunger and a finger on either side of the nozzle. Insert the nozzle into a nostril until your fingers touch the person's nose. Keep the nozzle straight into the nose pointed toward the forehead.

Tell the person not to sniff during or after the dose is given. Press the plunger up firmly until it snaps up and sprays liquid into the nostril.

It is recommended that those who have been prescribed an epinephrine nasal spray always carry 2 devices with them. If the signs and symptoms come back or get worse after 5 minutes, give a second dose in the same nostril.

Epinephrine Autoinjector

Autoinjectors use a spring-loaded needle to rapidly administer a measured, single dose of epinephrine. If a person is unable to self-administer an injection, the first aid provider may be able to do it for them.

The EPIPEN® is an epinephrine autoinjector commonly used to treat severe allergic reactions in adults and children who weigh 66 pounds or more. It is designed to work through clothing.

Storage of Epinephrine Autoinjectors

Epinephrine autoinjectors must be stored in a location readily accessible in an emergency and in accordance with manufacturer guidelines.

For example, EPIPEN® and EPIPEN JR® autoinjectors should be stored in the carrier tube provided at a temperature of 68-77° Fahrenheit (20-25° Celsius). They should not be stored in refrigerators, in a vehicle's glove box, or exposed to extreme heat or cold. They should be protected from light because the medication deteriorates rapidly on exposure to light.

Periodically inspect the solution for contamination by foreign particles or a pinkish or brown discoloration. These changes indicate that the effectiveness of medication may be reduced. If found, the device should be replaced.

Using an Epinephrine Autoinjector

Remove the EPIPEN autoinjector 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.

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.

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.[70]

It is recommended that those who have been prescribed an epinephrine autoinjector always carry 2 devices with them. If the signs and symptoms come back or get worse, give a second dose with a new epinephrine autoinjector if available.

Use of epinephrine nasal spray or autoinjectors are for emergency use only and are not a substitute for immediate, professional medical care. More than two doses of epinephrine should only be administered under direct medical supervision.

Activate EMS and/or your EAP if you haven't done so already. 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.

A used epinephrine nasal spray device may be disposed of in the regular trash. Give a used autoinjector to EMS providers for proper disposal or follow your employer's bloodborne pathogens exposure control plan for managing sharps.

ADULT – RELIEF OF CHOKING (FIRST AID ONLY)

Choking, also known as foreign-body airway obstruction (FBAO), 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.

To provide the appropriate care, you must be able to recognize the difference between a mild and a severe airway obstruction.

Mild 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 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.

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 their throat.

Follow the Procedure for Adult and Child Foreign-Body Airway Obstruction. Ask, “May I help you? Are you choking?” If the person nods yes, or is unable to speak or cough, act quickly. If you are not alone, have someone activate EMS and/or your EAP. Send someone to get a first aid kit and an AED.

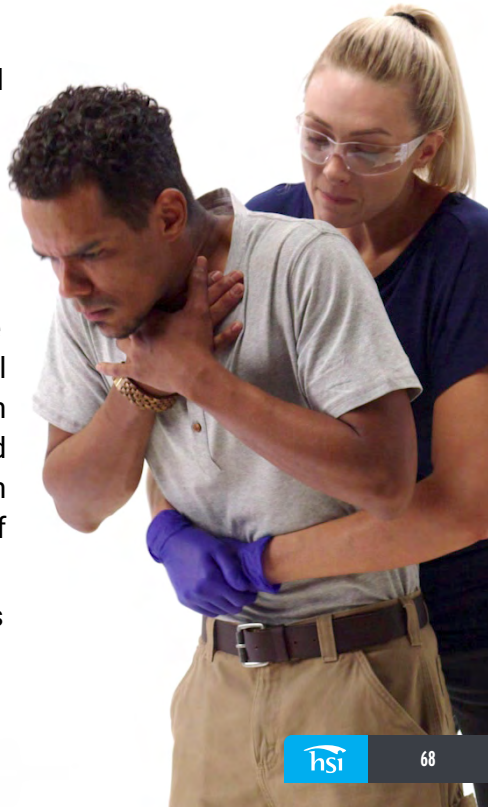
Give Back Blows

To give back blows, stand to the side and just behind a choking adult. Place one arm diagonally across the person’s chest to support their body. Bend the person over at the waist to face the ground.

Give 5 forceful back blows between the person’s shoulder blades with the heel of your hand. Give each back blow forcefully with the intent of dislodging and expelling the object.

If 5 back blows do not dislodge the object, follow with 5 abdominal thrusts.

Give Abdominal Thrusts



To give abdominal thrusts, stand behind the person. If possible, take a staggered stance with one foot in between the person’s feet and the other foot slightly behind you for balance. Locate the person’s navel.

Make a fist and place it thumb-side against the abdomen, just above the navel and below the ribs. Grasp your fist with your other hand. 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 the cycle of 5 back blows

followed by 5 abdominal thrusts until the person can breathe normally or becomes unresponsive.

If the object is expelled and the person can inhale and exhale again, encourage the person to be seen by a healthcare professional. Though infrequent, serious complications from abdominal thrusts can occur.

Chest Thrusts

If you have given 5 back blows, but you cannot wrap your arms around the person to give abdominal thrusts because they are pregnant, in a wheelchair, or too large for you, use chest thrusts instead.

Give Chest Thrusts

To give chest thrusts, reach under the person's 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 not to put pressure on the ribs. Give each chest thrust forcefully with the intent of dislodging and expelling the object.

If chest thrusts do not dislodge the object, repeat the series of 5 back blows and 5 chest thrusts until the object is expelled and the person can breathe, or the person becomes unresponsive.

Unresponsive and Choking

If the person becomes unresponsive, carefully lower them to a firm, flat surface.

If you are alone and have not done so already, activate EMS and/or your EAP.

If you are trained in conventional CPR with breaths, immediately start high-quality CPR beginning with chest compressions.

Before opening the airway to provide breaths, open the person's mouth wide. If you see an object, remove it by sweeping it out with your fingers. Do not stick your finger blindly in a person's throat and attempt to sweep out an object. This can cause injury or push the object further down the throat, worsening the obstruction.

Tilt the head and lift the chin to open the airway. Use a CPR mask and give 2 breaths. Immediately resume high-quality chest compressions.

Continue performing CPR cycles of 30 compressions and 2 breaths. Check for an object in the person's mouth before each set of 2 breaths. If you see an object, remove it by sweeping it out with your fingers.

Compression-Only CPR

If untrained, unwilling, or unable to provide breaths, begin compression-only CPR immediately after activating EMS and/or your EAP, because it is better than no CPR.

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.

Choking While Alone

If you are having a choking emergency, are unable to speak or cough and are alone, call 911 to activate EMS using a mobile device if possible. Even if you cannot speak, dialing 911 and leaving the line open will allow dispatchers to trace your call and send help.

Risk of Choking

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.

CHEST PAIN & HEART ATTACK

Chest pain is a common health problem with multiple causes, ranging from mild injury to the muscles of the chest wall to myocardial infarction, commonly known as a heart attack.

"Myocardial" 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 arteries supplying the heart. When plaque in an artery breaks, a blood clot forms and blocks the flow of blood and oxygen to the heart muscle, causing a heart attack. Less commonly, a severe spasm or sudden contraction of an 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. Symptoms can be mild, or more intense and sudden. Symptoms also may come and go over several hours.

Chest pain is a common symptom of heart attack. Other signs and symptoms include pressure in the chest, shortness of breath, nausea, sweating, or pain in the jaw, one or both arms, or the back.

Females 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.

Sudden Cardiac Arrest vs. Heart Attack

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. Anyone not formally trained in CPR should provide compression-only CPR.

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.

When signs and symptoms of a heart attack appear suddenly or worsen rapidly, follow the Procedure for Adult First Aid. Begin with assessment.

With consent, help the person 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 while awaiting the arrival of EMS.

Aspirin can help prevent blood clots from forming in arteries supplying the heart and can reduce tissue damage. The suggested dose is 1 adult 325-milligram tablet, or 2 to 4 low-dose "baby" aspirins, 81 milligrams each, chewed and swallowed. The aspirin should not be coated.

Calm, comfort, and reassure the person. 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.[71]

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 one- and two-year-olds, 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. [72]

Safety & Health Tip

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.

Suspected Opioid-Associated Emergency

Opioids are a class of natural, semi-synthetic, and synthetic drugs. These include both prescription medications used to treat pain and illegal drugs like heroin. Most overdose deaths in recent years involved illicitly manufactured fentanyl and other potent synthetic opioids.[73]

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.

Opioids can cause death by slowing, and eventually stopping, breathing. Recognizing an opioid overdose can be difficult.

Signs of an overdose may include the following:

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

If you suspect an opioid-associated emergency, follow the procedure that aligns with your training. Begin with assessment.

Avoid contact with drug residue, containers, needles, and other paraphernalia.

If the person is unresponsive and breathing normally, place the person on their side in the recovery position to help protect the airway.

Naloxone

A quick response to an opioid overdose, including administering naloxone, if available, 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[74]

NARCAN® Nasal Spray is an opioid reversal medication containing naloxone.

To use NARCAN Nasal Spray, peel back the package to remove the device. Lay the person on their back. Hold the NARCAN Nasal Spray with your thumb on the bottom of the red plunger and your first and middle fingers on either side of the nozzle. Tilt the person's head back and provide support under the neck with your hand.

Gently insert the tip of the nozzle into one nostril until your fingers on either side of the nozzle are against the bottom of the person's nose. Press the red plunger firmly to give a dose of NARCAN Nasal Spray.[75]

If the person does not respond by waking up, respond to voice or touch, or start breathing normally, another dose may be given in the same way. Narcan Nasal Spray may be given every 2 to 3 minutes, if available.

If the person is not breathing or only gasping, immediately start CPR. Give naloxone if available, but do not delay CPR to give it.

Swallowed Poisons

If you suspect a person has ingested something poisonous, act quickly. Follow the Procedure for Adult First Aid. Begin with assessment.

If the product swallowed is burning, irritating, or caustic, and the person is able to swallow, have them drink a small amount of water or milk immediately.[76] 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.

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, coughing up blood mixed with mucus or spit, 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 exposure to a poisonous chemical gas occurs when a person mixes ammonia with cleaners 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 preplanning, proper emergency response training, and specialized PPE such as positive pressure self-contained breathing apparatus.

If you suspect an inhaled poisoning, follow the Procedure for Adult First Aid. Begin with assessment.

If there is an immediate danger to the victim and you can take action without placing yourself at unreasonable risk, get the victim to fresh air immediately.

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

Safety & Health Tip

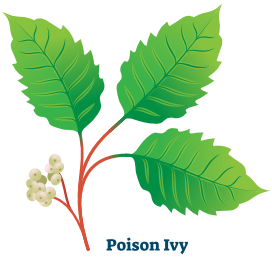
Carbon monoxide (CO) is harmful when breathed because it displaces oxygen in the blood and deprives the heart, brain, and other vital organs of oxygen. Large amounts of CO can overcome you in minutes without warning, causing you to lose consciousness and suffocate. Avoid the use of gas-powered engines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

Poisonous Plants

Poison ivy, poison oak and poison sumac are common poisonous plants. These plants produce a skin-irritating resin called urushiol.

Urushiol causes an itchy, irritating rash within days of exposure for most people who touch it. In addition to itching, small, raised bumps and fluid-filled blisters appear on the skin. The size of the rash and severity of symptoms correspond to the extent and duration of urushiol's contact with the skin.

To treat the rash, immediately rinse the skin with soap and water or a commercially available poisonous plant skin wash.



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.[77] 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 occupational PPE such as vests, coveralls, and full body suits; and drinking any available rehydration drink or water. 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.

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 Procedure for Adult First Aid. Begin with assessment.

If the person appears dehydrated due to a hot environment, and in the absence of shock, confusion, or inability to swallow, encourage the person to rehydrate with any available rehydration drink or water.

Heat Exhaustion

Heat exhaustion can occur as a combined result of a rising internal temperature and dehydration. Symptoms include nausea, dizziness, muscle cramps, feeling faint, 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. Help them loosen or remove excess clothing, including occupational PPE. Have the person lie down. Consider raising their legs 6–12 inches. Do not raise the legs if it causes pain or if the person is injured. Spray water on or apply cool wet cloths to the head and torso. Use a fan or fan the person to increase the cooling effect. If the person is alert and able to swallow, encourage them to rehydrate with any available rehydration drink or water.

In most cases, the person's condition will gradually get better. If the person does not improve or seems to get worse, activate EMS and/or your EAP.

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

Heatstroke is a life-threatening medical emergency that can lead to sudden circulatory failure and death. Heat stroke includes all the signs and symptoms of heat exhaustion and impairment in the normal functioning of the brain. The person experiences changes in thinking and behavior including confusion, agitation, and aggression. They may lose consciousness.[78]

Follow the Procedure for Adult First Aid. Begin with assessment. If a person with suspected heat stroke is unresponsive and not breathing normally or only gasping, immediately start high-quality 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 damaging effects on vital organs.

When possible and it can be done safely, begin immediate cooling by immersing the person up to the chin in cool to cold water for 15 minutes or until the signs and symptoms subside.

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.

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 and Frostbite

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 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 98.6–102.2° Fahrenheit or 37– 39° Celsius. [79] 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. Ibuprofen may be given to a person with frostbite to help prevent further tissue damage and to treat pain.

When rewarming is complete, use bulky, dry gauze dressings wrapped loosely on the thawed part to protect it 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.

Hypothermia

Humans normally maintain an average core body temperature of 98.6 degrees Fahrenheit (37 degrees Celsius). Hypothermia is an abnormally low core body temperature that begins when the core temperature falls below 95 degrees Fahrenheit (or 35 degrees Celsius).

Basic first aid should be guided by signs and symptoms rather than core body temperature, because it is difficult to obtain accurately. Hypothermia is categorized as mild, moderate, and severe or profound. Hypothermia frequently accompanies frostbite and can be fatal.

Mild Hypothermia

A person with mild hypothermia is typically conscious, alert, and shivering with impaired movement.

If the person cannot immediately be moved to warm shelter, protect them from cold and further heat loss. Cover their head and neck. Insulate them from the ground and wind using a plastic or foil layer, a foam sleeping pad, and a hooded sleeping bag or an equivalent dry insulating layer.

If the person can be immediately moved into a warm shelter, remove any wet clothing and gently dry the person. Use blankets, quilts, sleeping bags, or any available materials to insulate them. Cover their head and neck to retain body heat.

If the person remains alert, provide them with high-calorie food and drink, for example, dark chocolate, granola, nuts, and hot chocolate. Have the person lie down for at least 30 minutes.

When available, place warm (not hot) water bottles in the person's armpits. Apply a large electric heat pad or blanket to the chest and back. The heat generated by small glove and boot chemical heat packs is not effective for rewarming a person with mild hypothermia. Heat sources, rubbing, and massage should not be applied to the person's arms and legs.

Avoid burns. Regularly check the person for excessive skin redness. If found, remove the heat source from the affected area.

Moderate Hypothermia

A person with moderate hypothermia is conscious and breathing. Their movement is impaired. They are not alert, and may have mumbling speech, confusion, or be unable to remove wet clothing. They may or may not be shivering.

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

As with mild hyperthermia, insulate and rewarm the person using all available methods and materials. 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.

Do not give food or drink or use a warm shower or bath to rewarm a person with an altered mental status from hypothermia. Do not allow them to stand or walk. Keep them lying down.

Severe Hypothermia

A person with severe hypothermia is cold and unconscious. Care for the person as you would for moderate hypothermia and assess their breathing. If they are not breathing, perform high-quality CPR.

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.

Safety & Health Tip

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

Hypothermia Treatment[80]

CATEGORY	SIGNS AND SYMPTOMS	TREATMENT RECOMMENDATIONS
Mild hypothermia	• Conscious, alert • Impaired movement • Shivering	• Handle gently. Seek shelter. • Protect from cold and further heat loss. • Provide passive rewarming; windproof outer layer, blankets. • Provide high-calorie food/drink (e.g., dark chocolate, granola, nuts, hot chocolate, Boost Plus®, Carnation Instant Breakfast™, etc.) • Insulate, provide heat to torso. • Have the person lie down for at least 30 minutes.
Moderate hypothermia	• Conscious, NOT alert • Impaired movement • Shivering or NOT shivering	• Call 911 to activate EMS using a mobile device and/or activate your EAP. • No standing or walking. • No food/drink. • Provide passive and active rewarming; large electric heat pads or blankets, large chemical heat pads, warm water bottles.
Severe/Profound hypothermia	• Unconscious • Unresponsive	As above, and: • Assess the person's breathing for 60 seconds. If not breathing, start CPR.

BITES & STINGS

Human and Animal 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. These wounds should always be evaluated by a medical professional.

Flush the bite wound with running tap water or sterile saline solution and apply an occlusive dressing.

Bites from animals such as raccoons, skunks, bats, and foxes can also cause rabies. Left untreated, rabies is fatal. Medical evaluation as soon as possible and within 24 hours is necessary for all animal and human bites that break the skin.

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, pluck or scrape it out as quickly as possible.

Local pain, redness, swelling, and itching generally occur at the sting site.

Care for bites and stings is intended to reduce symptoms of pain, swelling, and itching at the site of the sting.

- As a precaution for swelling, remove any jewelry from the affected area as necessary.
- Wash the site with soap and water.
- Applying a 1% hydrocortisone ointment or cream may help lessen itching at the sting site.
- Common over-the-counter allergy relief medication and anti-itch products can alleviate itching.

- A bag of ice and water wrapped in a towel, or a cold pack, can also be used to reduce swelling and lessen pain at the sting site.

Although rare, stings to the eye itself can lead to permanent vision loss and require immediate medical attention.

If the person experiences wheezing; swelling of the lips, eyelids, or face; or itchy, red raised lumps, called hives, on the face and chest, follow the steps covered in the severe allergic reaction lesson.

Venomous Snakebite

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.

Signs and symptoms of a pit viper bite include the following:

- Bite-site puncture marks
- Significant and spreading bite-site redness, swelling, and tenderness
- Bite-site pain, numbness, and bruising
- Fear and anxiety
- Nausea and vomiting

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. The main consequence of a venomous snake bite is damage to tissue at the injury site.

However, any bite by a venomous species must be evaluated by a physician without delay. Serious damage and death are preventable with antivenom, which is the definitive treatment for venomous snakebites.

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.

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 photograph of the snake from a safe distance for later identification.

Follow the Procedure for Adult First Aid. Begin with assessment.

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.

The wound should be quickly cleaned with soap and running water or an antiseptic solution, and a sterile dressing applied to protect the wound. Keep the affected area at the level of the heart to reduce swelling and the spread of venom.

Do not apply a tourniquet; suck out the venom by mouth or mechanical means; cut or "bleed" the bite site; apply an electric shock, apply a pressure immobilization bandage; or apply ice or cold.[81,82]

Keep the person quiet and still. Stay with them until someone with more advanced training takes over or EMS arrives.

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 wild snake.

Venomous Spider Bites and Scorpion Stings

Spider bites and scorpion stings are common in the United States.[83] Many spider bites and scorpion stings are harmless. However, some spiders, such as the black widow and the brown recluse, and some scorpions, including the bark scorpion, can cause severe reactions at the bite site and throughout the body.

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.

Call Poison Control Help at 1-800-222-1222 for information regarding the immediate treatment of venomous bites and stings. Anticipate swelling and remove jewelry or constrictive clothing near the bite or sting site.

Appropriate first aid for venomous bites and stings includes washing the area well with soap and water to prevent infection. Over-the-counter acetaminophen, aspirin, and ibuprofen can be used to alleviate local pain from scorpion stings. If the skin is intact, applying an over the counter 5% topical lidocaine cream or gel can help control pain. Hold ice packs or cold packs to the site for local pain relief from scorpion stings.

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

If the person develops signs and symptoms of a severe allergic reaction, follow the Procedure for Adult First Aid. Begin with assessment. Follow the steps covered in the severe allergic reaction lesson.

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 transmission of Lyme disease which occurs at a high rate in the Northeast, mid-Atlantic, and upper Midwest of the United States. A person in these regions who experiences tick bites should receive medical attention within 72 hours of tick removal. Administration of antibiotics in this time frame may prevent 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 out 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. Apply a clean occlusive dressing. When you are finished, thoroughly wash your hands.

If portions of the tick remain in the skin or the person develops a fever, rash, or aches after 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.

Jellyfish Stings

Stings from jellyfish are a common occurrence when a person is in or around the ocean environment. Jellyfish stings typically cause immediate burning pain, itching, and red, brown, or purple tracks on the skin.

Quickly remove any tentacles stuck to the skin by plucking them off with tweezers or gloved hands. Do not scrape or rub them off as doing so can cause an additional release of venom. If tweezers or gloves are not available, rinse the affected area with seawater.

To relieve pain after removing the tentacles, immerse the affected area in non-scalding hot water 104° Fahrenheit or 40° Celsius until the pain subsides. If hot water is not available, applying an over the counter 5% topical lidocaine cream or gel can help control pain.

Life-threatening reactions are rare. If the person develops signs and symptoms of a severe allergic reaction, follow the Procedure for Adult First Aid. Begin with assessment. Follow the steps covered in the severe allergic reaction lesson.

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.[84]

Signs and symptoms of a stingray injury may include a spear-like barb embedded in the skin and/or 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 ae 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.

If the person develops signs and symptoms of a severe allergic reaction, follow the Procedure for Adult First Aid. Begin with assessment. Follow the steps covered in the severe allergic reaction lesson.

SECTION FOUR

CHILD CPR AED LESSONS

CHILD – PROCEDURE FOR PEDIATRIC CPR AED

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

Secondary Cardiac Arrest

More often though, cardiac arrest in a child results from asphyxia, a lack of oxygen that occurs when breathing slows or stops.

The lack of oxygen causes the heart to stop within minutes. 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.

In CPR, 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.

Follow the Procedure for Pediatric CPR AED

There are three main elements of the Procedure for Pediatric CPR AED: assessment of the scene and child, actions based on the presence or absence of normal breathing, and use of an AED.

First, assess scene safety. This includes taking standard precautions. If the scene is safe, assess 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 a first aid kit and an AED. Take at least 5 seconds and no longer than 10 seconds to assess breathing. Then, take action based on the presence or absence of normal breathing.

Unresponsive, Breathing Normally

If an unresponsive child is breathing normally, place the child in the recovery position to help protect the airway. Regularly reassess scene safety, responsiveness, and breathing. Stay with them until someone with more advanced training takes over or EMS arrives.

Unresponsive, Not Breathing Normally

If an unresponsive child is not breathing normally or only gasping, and you are alone, immediately start CPR, beginning with chest compressions. Immediate CPR with an emphasis on effective breaths may provide the only chance for survival.

If you are alone without a mobile device, give two minutes of CPR before leaving the child (or if the child is uninjured, carry them with you) to get an AED and activate EMS and/or your EAP, if you haven’t done so already.

Additional Considerations - Drowning

The immediate cause of death in drowning is a lack of oxygen. As they provide life-sustaining oxygen, giving breaths before chest compressions is emphasized. As soon as the unresponsive child is removed from the water, assess breathing for at least 5 seconds and no more than 10 seconds. If there is no breathing, open the airway and give 2 breaths that make the chest rise. Continue CPR by providing cycles of 30 high-quality chest compressions and 2 breaths. Never delay CPR to get or apply an AED.

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. Move any bulky clothing covering the chest out of the way.

Position yourself at the child's side, kneeling close to the chest. For child compressions, place 1 or 2 hands on the center of the chest, on the lower half of the breastbone. For a small child, 1 hand may be enough. Position your shoulders directly above your hands and straighten your arms to lock your elbows. 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).

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.

Avoid leaning on the chest between compressions. Complete chest recoil allows the heart to refill.

Compress the chest at a rate of 100–120 compressions per minute. Minimize interruption in chest compressions.

CHILD – AIRWAY, BREATHS & USING A CPR MASK

There must be an open airway to give breaths to a child. The method to open the airway is the same: head tilt-chin lift.

Breaths are extremely important for children because cardiac arrest typically results from asphyxia, an inadequate supply of oxygen to the body.

Avoid giving too many breaths or a large volume because it can be harmful. It can force air into the stomach, causing regurgitation of food, liquids, or vomit into the airway.

Take standard precautions when providing child breaths. Use a CPR mask. The same size is used for a child as for an adult.

Position yourself at the child'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 breath by blowing through the valve opening. Each breath is 1 second in length. Give enough air to create a visible rise of chest, but no more. Stop your breath as soon as you see chest rise. Remove your mouth and let the child exhale.

Safety & Health Tip

Drowning is the leading cause of unintentional death among children ages 1 to 4 years old.[85] Close, constant, and attentive supervision of young children in or around any water is essential to prevent drowning.[86] The American Academy of Pediatrics (AAP) recommends several ways parents can help keep children safe around home swimming pools and hot tubs. Pool fencing is the most effective, proven way to prevent drowning of young children. Pool alarms, door and gate alarms, and pool covers provide added safety. Additional precautions include assigning a water watcher to watch all children swimming or playing in or near water, putting children in a properly fitted U.S. Coast Guard approved life jacket, swimming lessons, and of course, all parents, caregivers, and pool owners should know how to perform CPR.[87]

CHILD - USING AN AED

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.

Pediatric pads are recommended for children under 8 years of age. If the pediatric 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. Do not apply pediatric pads to persons 8 years of age and older because the energy level of the shock will be too low.

Turn on the AED and bare the child’s chest. If there is a button, “key,” or another type of mechanism for switching to pediatric use, activate it. 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. Make sure the pads do not overlap or touch each other.

When the AED voice prompts you, be certain no one is touching the child. This allows the AED to analyze the heart rhythm.

If the AED advises a shock, it will prompt you to clear the child again. Loudly say, “Everybody clear,” or something similar. Be certain that no one is touching the child. 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 analyze the heart rhythm again.

Continue CPR and AED use 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 the child begins responding, regularly reassess responsiveness, airway, and breathing.

CHILD – ONE-PROVIDER CPR AED

One CPR provider can provide high-quality CPR by putting together all the skills of assessment, chest compressions, airway, breaths, and AED use. Follow the Procedure for Pediatric CPR AED. Begin with assessment. If an unresponsive child is not breathing normally or only gasping, start high-quality CPR.

High-Quality CPR

Position the child on a firm, flat surface. Move any bulky clothing covering the chest out of the way. Position 1 or 2 hands on the lower half of the breastbone. Perform 30 high-quality chest compressions. 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.

Open the airway and use a CPR mask to give 2 breaths. Ensure each breath is 1 second in length and creates visible rise of the chest. Immediately resume high-quality chest compressions.

Repeat CPR cycles of 30 compressions and 2 breaths for two minutes.

If you are alone without a mobile device, give two minutes of CPR before leaving the child (or if the child is uninjured, carry them with you) to get an AED and activate EMS and/or your EAP, if you haven't done so already.

As soon as an AED is available, power on the AED. Bare the chest. Follow the AED voice prompts. If there is a button, "key," or another type of mechanism for switching to pediatric use, activate it. Use pediatric pads for children below 8 years of age. Correctly apply the AED pads according to the pictures. If the pediatric pads are not available, use the adult pads.

When the AED voice prompts you, clear the child to allow the AED to analyze the heart rhythm. If the AED advises a shock, make sure no one is touching the child. Deliver a shock. Once a shock has been delivered, immediately resume CPR starting with chest compressions.

Follow the voice prompts. After about two minutes of CPR, the AED will analyze the heart rhythm again.

Continue CPR and AED use 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.

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.[88] *Research has shown that some chest protectors may reduce the incidence of commotio cordis.*[89]

CHILD – SUSPECTED OPIOID-ASSOCIATED EMERGENCY

Accidental and intentional opioid ingestions occur in young children, mirroring the opioid epidemic in adolescents and adults.[90]

If you suspect a child has overdosed on a prescription or illicit opioid, follow the Procedure for Pediatric CPR AED. Give naloxone as soon as you can, but do not delay CPR to give it.

Safety & Health Tip

Protect children from accidental overdose by always locking the safety cap on medicine bottles and storing all mediations out of reach.

CHILD - RELIEF OF CHOKING

A child can experience mild or severe airway obstruction due to an object stuck in the upper airway.

Mild Obstruction

If the child can inhale and exhale, encourage the child to continue coughing. Watch for signs of the airway obstruction becoming severe.

Severe 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.

Signs of a severe airway obstruction include the inability to speak, 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 their throat.

Follow the Procedure for Adult and Child Foreign-Body Airway Obstruction (FBAO). Begin with assessment. If you are not alone, have someone activate EMS and/or your EAP. Send someone to get a first aid kit and an AED.

Responsive Child

Ask, "Are you choking?" If the child nods yes, or is unable to speak or cough, act quickly.

Give Back Blows

To give back blows, stand to the side and just behind a choking child. If needed, kneel behind a smaller child. Place one arm diagonally across the child's chest to support their body. Bend the child over at the waist to face the ground.

Give five forceful back blows between the child's shoulder blades with the heel of your hand. Give each back blow forcefully with the intent of dislodging and expelling the object.

If 5 back blows do not dislodge the object, follow with 5 abdominal thrusts.

Give Abdominal Thrusts

To give abdominal thrusts, stand behind the child. If possible, take a staggered stance with one foot between the child's feet and the other

foot slightly behind you for balance. If needed, kneel behind a smaller child.

Locate the child's navel. Make a fist and place it thumb-side against the abdomen, just above the navel and below the ribs. Grasp your fist with your other hand. 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 the cycle of 5 back blows followed by 5 abdominal thrusts until the child can breathe normally or becomes unresponsive.

If Successful

If the object is expelled and the child can inhale and exhale again, the child should be seen by a healthcare professional. Though infrequent, serious complications from abdominal thrusts can occur.

Unresponsive Child

If the child becomes unresponsive, carefully lower them to a firm, flat surface. If you are alone and have not done so already, activate EMS and/or your EAP.

If you are trained in conventional CPR with breaths, immediately start high-quality CPR beginning with chest compressions. Before opening the airway to provide breaths, open the child's mouth wide. If you see an object, remove it by sweeping it out 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.

Continue performing CPR cycles of 30 compressions and 2 breaths. Check for an object in the child's mouth before each set of 2 breaths. If you see an object, remove it by sweeping it out with your fingers.

Breaths are extremely important for children. If unwilling or unable to provide breaths, perform compression-only CPR because it is better than no CPR.

Continue 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.

Safety & Health Tip

You can help reduce children's risk of choking when eating by cutting food into small pieces. Cut tube-shaped foods such as hot dogs into short strips rather than round pieces. Avoid serving foods that are as wide around as a nickel, which is about the size of a young child's throat.[91]

SECTION FIVE

INFANT CPR AED LESSONS

INFANT – PROCEDURE FOR PEDIATRIC CPR AED

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.

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

Follow the Procedure for Pediatric CPR AED

There are three main elements of the Procedure for Pediatric CPR AED: assessment of the scene and infant, actions based on the presence or absence of normal breathing, and use of an AED.

First, assess scene safety. This includes taking standard precautions. If the scene is safe, assess responsiveness. Gently 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 a first aid kit and an AED.

Take at least 5 seconds and no longer than 10 seconds to assess breathing. Then, take action based on the presence or absence of normal breathing.

Unresponsive, Breathing Normally

If an unresponsive infant is breathing normally, place the infant in the recovery position to help protect the airway. Cradle the infant in your arms, with their head tilted downwards to prevent them from choking or inhaling vomit or fluids.

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

Unresponsive, Not Breathing Normally

If an unresponsive infant is not breathing normally or only gasping, and you are alone, immediately start CPR, beginning with chest compressions. Immediate CPR with an emphasis on effective breaths may provide the only chance for survival.

If you are alone without a mobile device, give two minutes of CPR. Then, if the infant is uninjured, bring the infant with you to get an AED and activate EMS and/or your EAP if you haven't done so already.

Additional Considerations - Drowning

The immediate cause of death in drowning is a lack of oxygen. As they provide life-sustaining oxygen, giving breaths before chest compressions is emphasized. As soon as the unresponsive infant is removed from the water, assess breathing for at least 5 seconds and no more than 10 seconds. If there is no breathing, open the airway and give 2 breaths that make the chest rise. Continue CPR by providing cycles of 30 high-quality compressions and 2 breaths. Never delay CPR to get or apply an AED.

Safety & Health Tip

More children ages 1–4 die from drowning than any other cause of death except birth defects. Among infants under 1 year old, two-thirds of all drownings occur in bathtubs.[92] *Always keep a young child within arm's reach in a bathtub. If you must leave, take the child with you. Don't leave a baby or toddler in a bathtub under the care of another young child.*[93]

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. Move any bulky clothing covering the chest out of the way.

Compression Technique

For infant chest compressions, use either the 2-thumb encircling-hands technique, or the heel of one hand.

For the 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.

For the 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's hands cannot encircle the infant's chest.

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 – AIRWAY, BREATHS & USING A CPR MASK

There must be an open airway to give breaths to an infant. The method to open the airway is the same: head tilt-chin lift. Keep an infant's head in a neutral "sniffing" position. Tilting the head beyond a neutral position may block the airway.

Importance of Breaths

Breaths are extremely important for infants because infant cardiac arrest typically results from asphyxia, an inadequate supply of oxygen to the body.

Avoid giving too many breaths or a large volume because it can be harmful. It can force air into the stomach, causing regurgitation of food, liquids, or vomit into the airway.

Take standard precautions when providing infant breaths. Use an infant 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 the mask under the bony ridge of the jaw.

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

Mouth-to-Mouth-and-Nose Technique

There may be circumstances when a barrier device is not available, and you are willing to provide breaths without a barrier. For infants, the preferred technique is mouth-to-mouth-and-nose breaths.

To give mouth-to-mouth-and-nose breaths 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, 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 breaths.

If you have difficulty making an effective seal over the mouth and nose, try using the mouth-to-mouth technique.

INFANT – USING AN AED

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.

Pediatric pads are recommended for infants. If pediatric 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.

Turn 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.

Peel the pads from the backing sheet one at a time and place each according to the pictures. The front-and-back pad position is common for infants. Press the pads firmly in place. Make sure the pads do not overlap or touch each other.

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

If the AED advises a shock, it will prompt you to clear the infant 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 two minutes of CPR, the AED will analyze the heart rhythm again. Continue CPR and AED use 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 the infant begins responding, regularly reassess responsiveness, airway, and breathing.

INFANT – ONE-PROVIDER CPR AED

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

Follow the Procedure for Pediatric CPR AED. Begin with assessment.

If an unresponsive infant is not breathing normally or only gasping, and you are alone, immediately start high-quality CPR.

High-Quality CPR

Position the infant on a firm, flat surface. Move any bulky clothing covering the chest out of the way. Use the 2-thumb encircling-hands technique or the heel of one hand. Perform 30 high-quality chest compressions. Compress 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.

Open the airway and use an infant CPR mask to give 2 breaths. Ensure each breath is 1 second in length and creates visible rise of the chest. Immediately resume high-quality chest compressions.

Repeat CPR cycles of 30 compressions and 2 breaths for two minutes.

If you are alone without a mobile device, give two minutes of CPR before leaving the infant (or if the infant is uninjured, carry them with you) to get an AED and activate EMS and/or your EAP if you haven't done so already.

As soon as an AED is available, power on the AED. Bare the chest. Follow the AED voice prompts. 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.

When the AED voice prompts you, clear the infant to allow the AED to analyze the heart rhythm. If the AED advises a shock, make sure no one is touching the infant.

Deliver a shock. Once a shock has been delivered, immediately resume CPR starting with chest compressions.

Follow the voice prompts. After about two minutes of CPR, the AED will analyze the heart rhythm again.

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.

INFANT – SUSPECTED OPIOID-ASSOCIATED EMERGENCY

Accidental and intentional opioid ingestions occur in young children, mirroring the opioid epidemic in adolescents and adults.[94]

If you suspect an infant has overdosed on a prescription or illicit opioid, follow the Procedure for Pediatric CPR AED. Give naloxone as soon as you can, but do not delay CPR to give it.

INFANT – RELIEF OF CHOKING

Mild Airway Obstruction

With a mild airway obstruction, the infant is coughing forcefully, has a strong cry, and can inhale and exhale. Watch for signs of the airway obstruction becoming severe.

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.

Follow the Procedure for Infant Foreign-Body Airway Obstruction (FBAO). Begin with assessment.

Responsive Infant

If the infant is responsive and you are not alone, have someone activate EMS and/or your EAP. Send someone to get a first aid kit and an AED.

Give Back Blows

To give back blows, kneel or sit with the infant in your lap. Hold the infant facedown over your forearm with the infant's legs straddled and their head lower than their chest. Support the head by holding the jaw. Rest your forearm on your lap or thigh to support the infant.

Using the heel of the other hand, give 5 forceful back blows between the infant's shoulder blades. Give each back blow forcefully with the intent of dislodging and expelling the object.

If 5 back blows do not expel the object, follow with 5 chest thrusts.

Give Chest Thrusts

To give 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 the heel of your hand on the breastbone just below the nipple line and give 5 chest thrusts. Give each chest thrust forcefully with the intent of dislodging and expelling the object.

Repeat the sequence of 5 back blows and 5 chest thrusts until the object is expelled and the infant can breathe, or the infant becomes unresponsive.

Unresponsive Infant

If the infant becomes unresponsive, carefully place them on a firm, flat surface. Move any bulky clothing covering the chest out of the way.

If you are alone and have not done so already, activate EMS and/or your EAP.

If you are trained in conventional CPR with breaths, immediately start high-quality CPR beginning with chest compressions.

Before opening the airway to provide breaths, open the infant's mouth wide. If you see an object, remove it by sweeping it out with your finger. 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.

Tilt the head and lift the chin to open the airway. Keep the infant's head in a neutral position. Use a CPR mask and give 2 breaths. Immediately resume high-quality chest compressions.

Continue performing CPR cycles of 30 compressions and 2 breaths. Check for an object in the infant's mouth before each set of 2 breaths. If you see an object, remove it by sweeping it out with your finger.

Breaths are extremely important for children. If untrained, unwilling, or unable to provide breaths, perform compression-only CPR because it is better than no CPR.

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 SIX

APPENDIX

FIRST AID & CPR AED PROVIDER

PROCEDURE FOR ADULT FIRST AID, CPR AED

PERFORM AN ASSESSMENT

- ASSESS SCENE SAFETY
- TAKE STANDARD PRECAUTIONS*
- ASSESS RESPONSIVENESS
- ACTIVATE EMS &/OR EAP†
- SEND SOMEONE TO GET A FIRST AID KIT & AN AED

ASSESS BREATHING FOR AT LEAST 5 SECONDS & 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 the 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.
- Calm, comfort, and reassure the person. Reassess regularly until another provider or EMS takes over.

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 the person on a firm, flat surface.
- Perform cycles of 30 high-quality chest compressions and 2 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 use to give it.

UNRESPONSIVE. NOT BREATHING NORMALLY, USE THE AED AS SOON AS IT IS AVAILABLE.
POWER ON THE AED. FOLLOW AED PROMPTS.

SHOCK ADVISED?

YES	NO
• Clear the person. • Give 1 shock. • Immediately resume high-quality CPR. • 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 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). Follow 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 a ratio of 30 compressions to 2 breaths. In the case of drowning, begin with 2 breaths.

CPR AED PROVIDER

PROCEDURE FOR ADULT CPR AED

PERFORM AN ASSESSMENT

- ASSESS SCENE SAFETY
- TAKE STANDARD PRECAUTIONS*
- ASSESS RESPONSIVENESS
- ACTIVATE EMS &/OR EAP†
- SEND SOMEONE TO GET A FIRST AID KIT & AN AED

ASSESS BREATHING FOR AT LEAST 5 SECONDS & 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 the person on a firm, flat surface.
- Perform cycles of 30 high-quality chest compressions and 2 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.
POWER ON THE AED. FOLLOW AED PROMPTS.

SHOCK ADVISED?

YES	NO
• Clear the person. • Give 1 shock. • Immediately resume high-quality CPR. • 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 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). Follow 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 a ratio of 30 compressions to 2 breaths. In the case of drowning, begin with 2 breaths.

CPR AED PROVIDER

PROCEDURE FOR PEDIATRIC CPR AED

PERFORM AN ASSESSMENT

- ASSESS SCENE SAFETY
- TAKE STANDARD PRECAUTIONS*
- ASSESS RESPONSIVENESS
- ACTIVATE EMS &/OR EAP†
- SEND SOMEONE TO GET A FIRST AID KIT & AN AED

ASSESS BREATHING FOR AT LEAST 5 SECONDS & 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 the child or infant on a firm, flat surface.
- Perform cycles of 30 high-quality chest compressions and 2 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.
POWER ON THE AED. FOLLOW AED PROMPTS.

SHOCK ADVISED?

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

CONTINUE UNTIL OTHER CPR OR EMS PROVIDERS TAKE OVER OR THE CHILD OR INFANT 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). Follow the dispatcher's instructions.

‡ In the case of drowning, begin with 2 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-thumb encircling-hands technique or the heel of one hand. 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.

FIRST AID PROVIDER

PROCEDURE FOR ADULT FIRST AID

PERFORM AN ASSESSMENT

- ASSESS SCENE SAFETY
- TAKE STANDARD PRECAUTIONS*
- ASSESS RESPONSIVENESS
- ACTIVATE EMS &/OR EAP†
- SEND SOMEONE TO GET A FIRST AID KIT & AN AED

ASSESS BREATHING FOR AT LEAST 5 SECONDS & 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 the 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.
- Calm, comfort, and reassure the person. Reassess regularly until another provider or EMS takes over.

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 take over 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). Follow 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 a ratio of 30 compressions to 2 breaths.

FIRST AID & CPR AED PROVIDER

PROCEDURE FOR ADULT & CHILD FOREIGN-BODY AIRWAY OBSTRUCTION (FBAO)

PERFORM AN ASSESSMENT

- ASSESS SCENE SAFETY
- TAKE STANDARD PRECAUTIONS*
- ASSESS RESPONSIVE PERSON FOR SIGNS OF AIRWAY OBSTRUCTION

MILD AIRWAY OBSTRUCTION

CAN SPEAK, COUGH, AND BREATHE

- Encourage the person to continue coughing.
- Watch for signs of the airway obstruction becoming severe.

SEVERE AIRWAY OBSTRUCTION

UNABLE TO SPEAK. WEAK COUGH, OR NO COUGH. UNABLE TO BREATHE

- ACTIVATE EMS &/OR EAP†
- SEND SOMEONE TO GET A FIRST AID KIT & AN AED

- Give five forceful back blows between the person's shoulder blades with the heel of your hand.
- If 5 back blows do not dislodge the object, follow with 5 abdominal thrusts.‡
- Continue the cycle of 5 back blows followed by 5 abdominal thrusts until the person can breathe normally or becomes unresponsive.
- If the person becomes unresponsive, carefully lower them to a firm, flat surface and immediately start CPR beginning with chest compressions.§
- Before opening the airway to provide breaths, open the person's mouth wide. If you see an object, remove it by sweeping it out with your fingers.||

* 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). Follow the dispatcher's instructions.

‡ If you cannot wrap your arms around the person to give abdominal thrusts because they are pregnant, in a wheelchair, or too large for you, use chest thrusts instead.

§ If untrained, unwilling, or unable to provide breaths, begin compression-only CPR.

|| Do not stick your finger blindly in a person's throat and attempt to sweep out an object. This can cause injury or push the object further down the throat, worsening the obstruction.

FIRST AID & CPR AED PROVIDER

PROCEDURE FOR INFANT FOREIGN-BODY AIRWAY OBSTRUCTION (FBAO)

PERFORM AN ASSESSMENT

- ASSESS SCENE SAFETY
- TAKE STANDARD PRECAUTIONS*
- ASSESS RESPONSIVE INFANT FOR SIGNS OF AIRWAY OBSTRUCTION

MILD AIRWAY OBSTRUCTION

CAN SPEAK, COUGH, AND BREATHE

- Watch for signs of the airway obstruction becoming severe.

SEVERE AIRWAY OBSTRUCTION

UNABLE TO CRY. WEAK COUGH, OR NO COUGH. UNABLE TO BREATHE

- ACTIVATE EMS &/OR EAP†
- SEND SOMEONE TO GET A FIRST AID KIT & AN AED

- Give five forceful back blows between the infant's shoulder blades with the heel of your hand.
- If 5 back blows do not dislodge the object, follow with 5 chest thrusts.
- Continue the cycle of 5 back blows followed by 5 chest thrusts until the infant can breathe normally or becomes unresponsive.
- If the infant becomes unresponsive, carefully place them on a firm, flat surface and immediately start CPR beginning with chest compressions.‡
- Before opening the airway to provide breaths, open the infant's mouth wide. If you see an object, remove it by sweeping it out with your fingers.§

* 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 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). Follow the dispatcher's instructions.

‡ If untrained, unwilling, or unable to provide breaths, begin compression-only CPR. 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.

§ 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.

FIRST AID PROVIDER

PROCEDURE FOR SEVERE OR LIFE-THREATENING EXTERNAL BLEEDING CONTROL

PERFORM AN ASSESSMENT

- ASSESS SCENE SAFETY
- TAKE STANDARD PRECAUTIONS*
- ASSESS RESPONSIVENESS
- ACTIVATE EMS &/OR EAP†
- SEND SOMEONE TO GET A FIRST AID KIT & AN AED

ASSESS BREATHING FOR AT LEAST 5 SECONDS & NO MORE THAN 10 SECONDS

RESPONSIVE, BREATHING

OBTAIN CONSENT: INTRODUCE YOURSELF & ASK, "MAY I HELP YOU?"

SEVERE OR LIFE-THREATENING EXTERNAL BLEEDING?

BLOOD POOLING ON THE GROUND (HALF A SODA CAN'S WORTH); RAPIDLY FLOWING, GUSHING, OR SPURTING FROM THE WOUND; CONTINUES DESPITE DIRECT PRESSURE; OR RESULTS IN SYMPTOMS SUCH AS DROWSINESS, DIZZINESS, CHEST PAIN, OR LOSS OF CONSCIOUSNESS.

IMMEDIATELY APPLY DIRECT MANUAL PRESSURE‡

PUSH HARD ON THE SOURCE OF BLEEDING, KEEP CONTINUOUS PRESSURE (WITH A HEMOSTATIC DRESSING, IF AVAILABLE)

NECK, SHOULDER, OR GROIN?

PACK THE WOUND AND APPLY DIRECT PRESSURE

ON AN ARM OR LEG?

APPLY A MANUFACTURED TOURNIQUET

* 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). Follow the dispatcher's instructions.

‡ When available, for adults and children approximately 2 years of age and older, a manufactured tourniquet should be used for life-threatening extremity bleeding and should be applied 2–3 inches above the bleeding site as soon as possible after the injury and be tightened until bleeding stops. 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 extremity bleeding, use an improvised tourniquet if you have trained and practiced in its correct use.

MINIMUM CONTENTS FOR FIRST AID KIT*

ITEM	#	MIN. SIZE
Medical examination gloves	2	pairs
Adhesive bandages	4	1 x 3 in
	4	¾ x 3 in
	4	Large Fingertip
	4	Knuckle
Adhesive tape	1	3/8 in x 2.5 yd
Topical wound gel or ointment (topical antibiotic)	10	1/57 oz (0.5 g) application
Alcohol-based hand sanitizer	10	1/32 oz application
Eye/skin wash, saline solution	1	1 oz
First aid guidebook	1	n/a
Supplies to secure dressing, roller bandage	4	2, 3, or 4 in x 4 yd
Utility shears/scissors	1	7 in

ITEM	#	MIN. SIZE
Splint (compact, moldable splinting device with securing mechanism; e.g., roller bandage, elastic bandage, triangular bandage, tape)	1	4 x 24 in
Supplies to control bleeding, sterile pad	8	4 x 4 in
Tourniquet, manufactured, windlass	1	n/a
Triangular bandages	2	40 x 40 x 56 in
Plastic bag, application of ice, storage of amputations or waste (or instant cold pack)	2	1 qt or 1 gal (4 x 5 in)
Aspirin, low-dose tablet, or	4	81mg
Adult aspirin, chewable	1	325 mg
Oral glucose tablet	1	20 g
Splinter forceps/tweezers	1	n/a

* Circulation. 2024 *https://www.ahajournals.org/doi/10.1161/CIR.0000000000001281*

SECTION SEVEN

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