FIRST AID | CPR AED

STUDENT BOOK

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References

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.

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.

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.

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.

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]

- 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.

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.

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]

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.

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.