PEDIATRIC FIRST AID | CPR AED

STUDENT BOOK

VERSION 10.0, 2026

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Appendix

RESPONDING TO AN EMERGENCY

Trained providers should follow established procedures for pediatric 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 procedure that aligns with your training (see appendix).*

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

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 the first aid kit and an AED.
6. Assess breathing for at least 5 seconds and no more than 10 seconds.[36]

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.

Assess Scene Safety

First, assess scene safety. Emergency scenes can be dangerous. Your personal safety is the highest priority, even before the safety of an ill or injured child. 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. Instead, activate EMS and/or your EAP.

Emergency Moves

It is best not to move an ill or injured child, especially when you suspect a spinal or pelvic injury. Only move an ill or injured child when there is immediate danger and you can act without placing yourself at unreasonable risk.

Consider if you can safely move the child, based on your physical ability, to avoid hurting yourself. If able, carry a small child away from immediate danger. If you decide it is necessary to move a larger child you cannot carry, the most effective emergency move is a drag.

When using a drag, pull in the direction of the long axis of the body to help keep the spine in line. Never pull on the child's head or pull the child's body sideways. Use your legs, not your back, and keep the child's weight as close to your body as possible. Avoid twisting.

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

Confined Spaces

Confined spaces are especially dangerous.[37] Although they are not necessarily designed for people, a confined space is often large enough for workers and children to enter. A confined space also has limited or restricted means for entry or exit and is not designed for continuous occupancy. Confined spaces include, but are not limited to, tanks, vessels, silos, storage bins, hoppers, vaults, pits, manholes, tunnels, equipment housings, ductwork, pipelines, etc. Many workers are injured and killed each year while working in confined spaces. Specialized training and equipment are necessary to rescue anyone (including a child) 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. Children are naturally curious about confined spaces. Adults must provide barriers to entry and teach them about the dangers of these areas.

CHILD – AIRWAY, BREATHS & USING A CPR MASK

Giving breaths provides oxygenation of the blood and removal of carbon dioxide. It is an important component for successful resuscitation.

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

Importance of Breaths

Breaths are especially important for children because cardiac arrest typically results from asphyxia. Conventional CPR with breaths should be performed by all trained pediatric 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 child'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.

Take standard precautions when providing breaths. Use a CPR mask. The same size mask is used for a child as is for an adult. Use of a CPR mask provides more effective breaths than mouth to face shield.[51] 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.

CHILD – ONE-PROVIDER CPR AED

One pediatric CPR provider can provide high-quality child CPR by putting together all the skills of assessment, chest compressions, airway, breaths, and AED use. Follow the Procedure for Pediatric First Aid, CPR AED, or the Procedure for Pediatric CPR AED. Begin with assessment.

If the child is unresponsive and 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.

If you are alone without a mobile device, give 2 minutes of CPR before leaving the child (or if the child is uninjured, carrying them with you) to get an AED and activate EMS and/or your EAP if you have not done so already.

As soon as an AED is available, power on the AED. Bare the chest. If there is a button, "key," or another type of mechanism for switching to child use, activate it. Use pediatric pads for children below 8 years of age. Correctly apply the AED pads according to the pictures.

If the child pads are not available, use the adult pads.

When the AED voice prompts you, clear the child to allow the AED to analyze the heart rhythm. While the AED is analyzing, make sure no one is touching the child. If directed by the AED to deliver a shock, be certain no one is touching the child. 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 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 that usually results in ventricular fibrillation leading to sudden cardiac death if treatment by defibrillation is not immediately given.[54] Research has shown that some chest protectors may reduce the incidence of commotio cordis.[55]

INFANT – USING AN AED

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.

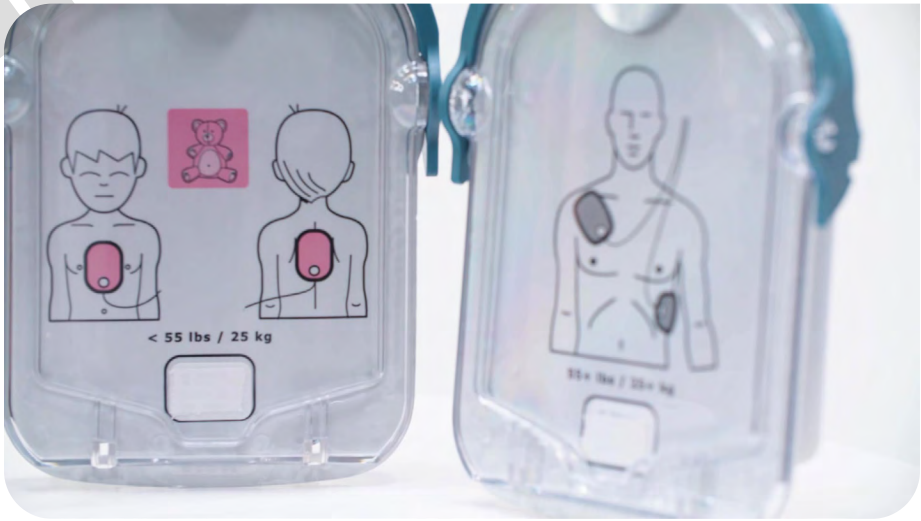
If the AED advises a shock, it will prompt you to clear the infant again. Loudly say, "Everybody clear," or something similar. For most AEDs, delivering a shock is done by pressing the shock button. Deliver a shock. Once a shock has been delivered, immediately resume CPR starting with chest compressions.

Follow the voice prompts. After about 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 infant starts breathing, moving, or reacting in other ways.

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

Safety & Health Tip

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



DROWNING

Drowning is the leading cause of unintentional death among children ages 1 to 4 years old.[72] Close, constant, and attentive supervision of young children in or around any water is essential to prevent drowning.[73,74]

Rescuing a drowning victim involves significant dangers. It is not uncommon for bystanders to drown while attempting a rescue.[75] Do not attempt a swimming rescue unless you are trained in water rescue and can do so without endangering yourself.

Follow the Procedure for Pediatric First Aid, CPR AED. Begin with assessment.

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. Ensure each breath is 1 second in length.

Continue high-quality CPR by providing cycles of 30 chest compressions and 2 breaths.

Use an AED as soon as one becomes available, but do not delay CPR to get or apply an AED in cardiac arrest following drowning.

When available, properly trained providers should give breaths with medical oxygen for drowning, if it does not delay CPR.

It is highly likely the child will vomit when CPR is performed. If this occurs, quickly roll them onto their side and remove any vomit in the mouth by sweeping it out with your fingers.

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.

EYE INJURIES

Seek immediate medical attention for a child who has a penetrating injury from a sharp or metal object, loss of vision, or whose injured eye is bleeding.

Follow the Procedure for Pediatric First Aid, CPR AED.

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

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.[96]

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 child's ability to see and is psychologically stressful.[97]

For a foreign body in the eye from a low-speed force such as dust or dirt blown into the eye by wind, allow the child's natural tears to wash the object out, or a first aid provider may flush the eye with tap water or a commercial eye wash solution.