

CARDIOPULMONARY RESUSCITATION (CPR): FIRST AID

By Mayo Clinic staff

Cardiopulmonary resuscitation (CPR) is a lifesaving technique useful in many emergencies, including heart attack or near drowning, in which someone's breathing or heartbeat has stopped.

Ideally, CPR involves two elements: chest compressions combined with mouth-to-mouth rescue breathing. (A complete description of how to do both follows farther down in this article.)

However, what you as a bystander actually should do in an emergency situation really depends on your knowledge and comfort level.

The bottom line is that it's far better to do something than to do nothing at all if you're fearful that your knowledge or abilities aren't 100 percent complete. Remember, the difference between your doing something and doing nothing could be someone's life.

Here's the latest advice from the American Heart Association:

- **Untrained.** If you're not trained in CPR, then provide hands-only CPR. That means uninterrupted chest presses of about two per second until paramedics arrive (described in more detail below). You don't need to try rescue breathing.
- **Trained, and ready to go.** If you're well trained, and confident in your ability, then you can opt for one of two approaches: 1. Alternate between 30 chest compressions and two rescue breaths, or 2. Just do chest compressions. (Details described below.)
- **Trained, but rusty.** If you've previously received CPR training, but you're not confident in your abilities, then it's fine to do just chest compressions.

The above advice applies only to adults needing CPR, not to children.

CPR can keep oxygenated blood flowing to the brain and other vital organs until more definitive medical treatment can restore a normal heart rhythm.

When the heart stops, the absence of oxygenated blood can cause irreparable brain damage in only a few minutes. Death will occur within eight to 10 minutes. Time is critical when you're helping an unconscious person who isn't breathing.

To learn CPR properly, take an accredited first-aid training course, including CPR and how to use an automatic external defibrillator (AED).

Before you begin

Assess the situation before starting CPR:

- Is the person conscious or unconscious?
- If the person appears unconscious, tap or shake his or her shoulder and ask loudly, "Are you OK?"
- If the person doesn't respond and two people are available, one should call 911 or the local emergency number and one should begin CPR. If you are alone and have immediate access to a telephone, call 911 before beginning CPR — unless you think the person has become unresponsive because of suffocation (such as from drowning). In this special case, begin CPR for one minute and then call 911.
- If an AED is immediately available, deliver one shock if advised by the device, then begin CPR.

Remember the ABCs

Think ABC — Airway, Breathing and Circulation — to remember the steps explained below. Move quickly through Airway and Breathing to begin chest compressions to restore circulation.

AIRWAY: Clear the airway

1. Put the person on his or her back on a firm surface.
2. Kneel next to the person's neck and shoulders.
3. Open the person's airway using the head-tilt, chin-lift maneuver. Put your palm on the person's forehead and gently tilt the head back. Then with the other hand, gently lift the chin forward to open the airway.
4. Check for normal breathing, taking no more than five or 10 seconds: Look for chest motion, listen for breath sounds, and feel for the person's breath on your cheek and ear. Gasping is not considered to be normal breathing. If the person isn't breathing normally and you are trained in CPR, begin mouth-to-mouth breathing. If you believe the person is unconscious from a heart attack and you haven't been trained in emergency procedures, skip mouth-to-mouth rescue breathing and proceed directly to chest compressions to restore circulation.

BREATHING: Breathe for the person

Rescue breathing can be mouth-to-mouth breathing or mouth-to-nose breathing if the mouth is seriously injured or can't be opened.

1. With the airway open (using the head-tilt, chin-lift maneuver) pinch the nostrils shut for mouth-to-mouth breathing and cover the person's mouth with yours, making a seal.
2. Prepare to give two rescue breaths. Give the first rescue breath — lasting one second — and watch to see if the chest rises. If it does rise, give the second breath. If the chest doesn't rise, repeat the head-tilt, chin-lift maneuver and then give the second breath.
3. Begin chest compressions to restore circulation.

CIRCULATION: Restore blood circulation with chest compressions

1. Place the heel of one hand over the center of the person's chest, between the nipples. Place your other hand on top of the first hand. Keep your elbows straight and position your shoulders directly above your hands.
2. Use your upper body weight (not just your arms) as you push straight down on (compress) the chest 2 inches (approximately 5 centimeters). Push hard and push fast — give two compressions per second, or about 120 compressions per minute.
3. After 30 compressions, tilt the head back and lift the chin up to open the airway. Prepare to give two rescue breaths. Pinch the nose shut and breathe into the mouth for one second. If the chest rises, give a second rescue breath. If the chest doesn't rise, repeat the head-tilt, chin-lift maneuver and then give the second rescue breath. That's one cycle. If someone else is available, ask that person to give two breaths after you do 30 compressions.
4. If the person has not begun moving after five cycles (about two minutes) and an automatic external defibrillator (AED) is available, apply it and follow the prompts. The American Heart Association recommends administering one shock, then resuming CPR — starting with chest compressions — for two more minutes before administering a second shock. If you're not trained to use an AED, a 911 operator may be able to guide you in its use. Trained staff at many public places are also able to provide and use an AED. Use pediatric pads, if available, for children ages 1 to 8. Do not use an AED for infants younger than age 1. If an AED isn't available, go to No. 5 below.
5. Continue CPR until there are signs of movement or until emergency medical personnel take over.

To perform CPR on a child

The procedure for giving CPR to a child age 1 through 8 is essentially the same as that for an adult. The differences are as follows:

- If you're alone, perform five cycles of compressions and breaths on the child — this should take about two minutes — before calling 911 or your local emergency number or using an AED.
- Use only one hand to perform heart compressions.
- Breathe more gently.
- Use the same compression-breath rate as is used for adults: 30 compressions followed by two breaths. This is one cycle. Following the two breaths, immediately begin the next cycle of compressions and breaths.
- After five cycles (about two minutes) of CPR, if there is no response and an AED is available, apply it and follow the prompts. Use pediatric pads if available. If pediatric pads aren't available, use adult pads.

Continue until the child moves or help arrives.

To perform CPR on a baby

Most cardiac arrests in infants occur from lack of oxygen, such as from drowning or choking. If you know the infant has an airway obstruction, perform first aid for choking. If you don't know why the infant isn't breathing, perform CPR.

To begin, assess the situation. Stroke the baby and watch for a response, such as movement, but don't shake the child.

If there's no response, follow the ABC procedures below and time the call for help as follows:

- If you're the only rescuer and CPR is needed, do CPR for two minutes — about five cycles — before calling 911 or your local emergency number.
- If another person is available, have that person call for help immediately while you attend to the baby.

AIRWAY: Clear the airway

1. Place the baby on his or her back on a firm, flat surface, such as a table. The floor or ground also will do.
2. Gently tip the head back by lifting the chin with one hand and pushing down on the forehead with the other hand.
3. In no more than 10 seconds, put your ear near the baby's mouth and check for breathing: Look for chest motion, listen for breath sounds, and feel for breath on your cheek and ear.

If the infant isn't breathing, begin mouth-to-mouth breathing immediately.

BREATHING: Breathe for the infant

1. Cover the baby's mouth and nose with your mouth.
2. Prepare to give two rescue breaths. Use the strength of your cheeks to deliver gentle puffs of air (instead of deep breaths from your lungs) to slowly breathe into the baby's mouth one time, taking one second for the breath. Watch to see if the baby's chest rises. If it does, give a second rescue breath. If the chest does not rise, repeat the head-tilt, chin-lift maneuver and then give the second breath.
3. If the chest still doesn't rise, examine the mouth to make sure no foreign material is inside. If the object is seen, sweep it out with your finger. If the airway seems blocked, perform first aid for a choking infant.
4. Begin chest compressions to restore circulation.

CIRCULATION: Restore blood circulation

1. Imagine a horizontal line drawn between the baby's nipples. Place two fingers of one hand just below this line, in the center of the chest.
2. Gently compress the chest to about one-third to one-half the depth of the chest.

3. Count aloud as you pump in a fairly rapid rhythm. You should pump at a rate of about 100 to 120 pumps a minute.
4. Give two breaths after every 30 chest compressions.
5. Perform CPR for about two minutes before calling for help unless someone else can make the call while you attend to the baby.
6. Continue CPR until you see signs of life or until a professional relieves you.

CHOKING: FIRST AID

By Mayo Clinic staff

Choking occurs when a foreign object becomes lodged in the throat or windpipe, blocking the flow of air. In adults, a piece of food often is the culprit. Young children often swallow small objects. Because choking cuts off oxygen to the brain, administer first aid as quickly as possible.

The universal sign for choking is hands clutched to the throat. If the person doesn't give the signal, look for these indications:

- Inability to talk
- Difficulty breathing or noisy breathing
- Inability to cough forcefully
- Skin, lips and nails turning blue or dusky
- Loss of consciousness

If choking is occurring, the Red Cross recommends a "five-and-five" approach to delivering first aid:

- First, deliver five back blows between the person's shoulder blades with the heel of your hand.
- Next, perform five abdominal thrusts (also known as the Heimlich maneuver).
- Alternate between five back blows and five abdominal thrusts until the blockage is dislodged.

To perform abdominal thrusts (Heimlich maneuver) on someone else:

- Stand behind the person. Wrap your arms around the waist. Tip the person forward slightly.
- Make a fist with one hand. Position it slightly above the person's navel.
- Grasp the fist with the other hand. Press hard into the abdomen with a quick, upward thrust — as if trying to lift the person up.
- Perform a total of five abdominal thrusts, if needed. If the blockage still isn't dislodged, repeat the five-and-five cycle.

If you're the only rescuer, perform back blows and abdominal thrusts before calling 911 or your local emergency number for help. If another person is available, have that person call for help while you perform first aid.

If the person becomes unconscious, perform standard CPR with chest compressions.

If you're alone and choking, you'll be unable to effectively deliver back blows to yourself. However, you can still perform abdominal thrusts to dislodge the item.

To perform abdominal thrusts (Heimlich maneuver) on yourself:

- Place a fist slightly above your navel.
- Grasp your fist with the other hand and bend over a hard surface — a countertop or chair will do.
- Shove your fist inward and upward.

Clearing the airway of a pregnant woman or obese person:

- Position your hands a little bit higher than with a normal Heimlich maneuver, at the base of the breastbone, just above the joining of the lowest ribs.
- Proceed as with the Heimlich maneuver, pressing hard into the chest, with a quick thrust.
- Repeat until the food or other blockage is dislodged or the person becomes unconscious.

Clearing the airway of an unconscious person:

- Lower the person on his or her back onto the floor.
- Clear the airway. If there's a visible blockage at the back of the throat or high in the throat, reach a finger into the mouth and sweep out the cause of the blockage. Be careful not to push the food or object deeper into the airway, which can happen easily in young children.
- Begin cardiopulmonary resuscitation (CPR) if the object remains lodged and the person doesn't respond after you take the above measures. The chest compressions used in CPR may dislodge the object. Remember to recheck the mouth periodically.

Clearing the airway of a choking infant younger than age 1:

- Assume a seated position and hold the infant facedown on your forearm, which is resting on your thigh.
- Thump the infant gently but firmly five times on the middle of the back using the heel of your hand. The combination of gravity and the back blows should release the blocking object.
- Hold the infant faceup on your forearm with the head lower than the trunk if the above doesn't work. Using two fingers placed at the center of the infant's breastbone, give five quick chest compressions.
- Repeat the back blows and chest thrusts if breathing doesn't resume. Call for emergency medical help.
- Begin infant CPR if one of these techniques opens the airway but the infant doesn't resume breathing.

If the child is older than age 1, give abdominal thrusts only.

To prepare yourself for these situations, learn the Heimlich maneuver and CPR in a certified first-aid training course.

FOREIGN OBJECT INHALED: FIRST AID

By Mayo Clinic staff

If you or your child inhales a foreign object, see your doctor. If the inhaled object causes choking, the American Red Cross recommends the "five-and-five" approach to delivering first aid:

- First, deliver five back blows between the victim's shoulder blades with the heel of your hand.
- Next, perform five abdominal thrusts (also known as the Heimlich maneuver).
- Alternate between five back blows and five abdominal thrusts until the blockage is dislodged.

If you're the only rescuer, perform back blows and abdominal thrusts before calling 911 or your local emergency number for help. If another person is available, have that person call for help while you perform first aid.

To perform the Heimlich maneuver on someone else:

- Stand behind the person. Wrap your arms around the waist. Tip the person forward slightly.
- Make a fist with one hand. Position it slightly above the person's navel.
- Grasp the fist with the other hand. Press hard into the abdomen with a quick, upward thrust — as if trying to lift the person up.
- Perform a total of five abdominal thrusts, if needed. If the blockage still isn't dislodged, repeat the five-and-five cycle.

To perform the Heimlich maneuver on yourself:

- Place a fist slightly above your navel.
- Grasp your fist with the other hand and bend over a hard surface — a countertop or chair will do.
- Shove your fist inward and upward.

FOREIGN OBJECT SWALLOWED: FIRST AID

By Mayo Clinic staff

If you swallow a foreign object, it will usually pass through your digestive system uneventfully. But some objects can lodge in your esophagus, the tube that connects your throat and stomach. If an object is stuck in your esophagus, you may need to remove it, especially if it is:

- A pointed object, which should be removed as quickly as possible to avoid further injury to the esophageal lining
- A tiny watch- or calculator-type button battery, which can rapidly cause nearby tissue injury and should be removed from the esophagus without delay

If a swallowed object blocks the airway, the American Red Cross recommends the "five-and-five" approach to first aid:

- First, deliver five back blows between the victim's shoulder blades with the heel of your hand.
- Next, perform five abdominal thrusts (also known as the Heimlich maneuver).
- Alternate between five back blows and five abdominal thrusts until the blockage is dislodged.

Call 911 or your local emergency number for help.

To perform abdominal thrusts (the Heimlich maneuver) on someone else:

- Stand behind the person. Wrap your arms around the waist. Tip the person forward slightly.
- Make a fist with one hand. Position it slightly above the person's navel.
- Grasp the fist with the other hand. Press hard into the abdomen with a quick, upward thrust — as if trying to lift the person up.
- Perform a total of five abdominal thrusts, if needed. If the blockage still isn't dislodged, repeat the five-and-five cycle.

You can't perform back blows on yourself. But you can perform abdominal thrusts.

To perform abdominal thrusts (the Heimlich maneuver) on yourself:

- Place a fist slightly above your navel.
- Grasp your fist with the other hand and bend over a hard surface — a countertop or chair will do.
- Shove your fist inward and upward.