First aid

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Cardiopulmonary resuscitation (CPR): First aid

Basics In-Depth Multimedia Resources

Learn the steps to use this lifesaving technique to help adults and children.

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Overview

Cardiopulmonary resuscitation (CPR) is an emergency treatment that's done when someone's breathing or heartbeat has stopped. For example, when someone has a heart attack or nearly drowns. CPR can help save a life.

The American Heart Association recommends starting CPR by pushing hard and fast on the chest. The pushes are called compressions. This hands-only CPR recommendation is for both people without training and first responders.

Here's CPR advice from the American Heart Association:

- **Not trained.** If you're not trained in CPR or don't want to put your mouth on the person's mouth or nose, then do hands-only CPR. Push hard and fast in the center of the chest 100 to 120 times a minute. Do this until medical help arrives. Details are described below. You don't need to place your mouth on the person's mouth or nose to give rescue breaths.
- **Trained and ready to go.** If you're well trained and confident in your CPR ability, check to see if there is a pulse and breathing. If there is no pulse or breathing within 10 seconds, begin chest compressions. Start CPR with 30 chest compressions. Then give two rescue breaths. Continue this pattern of chest compressions and rescue breaths until medical help arrives.
- **Trained but out of practice.** If you've previously received CPR training but you're not confident in your abilities, then just do 100 to 120 chest compressions a minute. Details are described below.

The above advice applies to situations in which adults, children and infants need CPR, but not newborns. Newborns are babies up to 4 weeks old.

CPR can keep oxygen-rich blood flowing to the brain and other organs until emergency medical treatment can get the heart beating again. When the heart stops, the body no longer gets oxygen-rich blood. The lack of oxygen-rich blood can cause brain damage in only a few minutes.

When to seek emergency help

If you are not trained but have immediate access to a phone, call 911 or your local emergency number before beginning CPR. The dispatcher can tell you how to do CPR until help arrives. To learn CPR properly, take an accredited first-aid training course. The course should include instructions on CPR and use of an automated external defibrillator (AED).

If you're afraid to do CPR or unsure how to do CPR correctly, know that it's always better to try than to do nothing at all. The difference between doing something and doing nothing could be someone's life.

Treatment

Before starting CPR, check:

- Is the environment safe for the person?
- Is the person conscious or not conscious?
- If the person appears to be not conscious, tap or shake their shoulder and ask loudly, "Are you OK?"
- If the person doesn't respond and you're with someone else who can help, have one person call 911 or the local emergency number and get an AED if one is available. Have the other person begin CPR.
- If you are alone and have immediate access to a phone, call 911 or your local emergency number before starting CPR. Get an AED if one is available.
- As soon as an AED is available, deliver one shock if instructed by the device. Then start CPR.

Remember to spell C-A-B

The American Heart Association uses the letters C-A-B to help people remember the order to perform the steps of CPR.

- **C:** compressions.
- **A:** airway.
- **B:** breathing.

Chest compressions

Compressions: Restore blood flow

Compressions means you use your hands to push down hard and fast in a specific way on the person's chest. Compressions are the most important step in CPR. Follow these steps for performing CPR compressions.

1. Put the person on their back on a firm surface.

2. Place the lower palm of your hand over the center of the person's chest, between the nipples.
3. Place your other hand on top of your first hand. Keep your elbows straight. Place your shoulders directly above your hands
4. Push straight down on the chest at least 2 inches (5 centimeters) but no more than 2.4 inches (6 centimeters). Use your entire body weight, not just your arms, when doing compressions.

Open the airway

Rescue breathing

5. Push hard and fast in the center of the chest. You want to do 100 to 120 compressions a minute. The American Heart Association suggests doing compressions to the beat of the song "Stayin' Alive" or another song that has 100 to120 beats a minute. Allow the chest to spring back after each push.
6. If you haven't been trained in CPR, continue chest compressions until there are signs of movement or until emergency medical help takes over. If you have been trained in CPR, go on to rescue breathing.

Airway: Open the airway

If you're trained in CPR and you've done 30 chest compressions, follow these steps to open the person's airway. This is called the head-tilt, chin-lift maneuver.

- Put your palm on the person's forehead.
- Gently tilt the head back.
- With the other hand, gently lift the chin forward to open the airway.

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. Current recommendations suggest doing rescue breathing using a bag-mask device with a high-efficiency particulate air (HEPA) filter.

Follow these steps after opening the airway using the head-tilt, chin-lift maneuver.

1. 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.
3. If the chest rises, give a second breath.
4. If the chest doesn't rise, repeat the head-tilt, chin-lift maneuver. Then give a second breath. Thirty chest compressions followed by two rescue breaths is considered

one cycle. Be careful not to provide too many breaths or to breathe with too much force.

5. Continue chest compressions to restore blood flow.
6. As soon as an automated external defibrillator (AED) is available, follow the device's directions. Give one shock, then continue chest compressions for two more minutes before giving a second shock. If you're not trained to use an AED, a 911 operator or another emergency medical operator may be able to tell you how to use the device. If an AED isn't available, go to step 7 below.
7. Continue CPR until there are signs of movement or emergency medical help takes over.

To perform CPR on a child

The process for giving CPR to a child age 1 through puberty is essentially the same as that for an adult — follow the C-A-B steps. The American Heart Association says you should not delay CPR and offers this advice on how to perform CPR on a child:

Compressions: Restore blood flow

If you are alone and didn't see the child collapse, start chest compressions and continue for about two minutes. Then quickly call 911 or your local emergency number and get an AED if one is available.

If you're alone and you did see the child collapse, call 911 or your local emergency number first. Then get an AED, if available, and start CPR. If another person is with you, have that person call for help and get the AED while you start CPR.

1. Place the child on their back on a firm surface.
2. Kneel next to the child.
3. Place two hands — or only one hand if the child is very small — on the lower half of the child's breastbone.
4. Using the lower palm of one or both hands, press straight down on the chest about 2 inches (5 centimeters) but not greater than 2.4 inches (6 centimeters). Push hard and fast — 100 to 120 compressions a minute.
5. If you haven't been trained in CPR, continue chest compressions until the child moves or until emergency medical help takes over. If you have been trained in CPR, open the airway and start rescue breathing.

Airway: Open the airway

If you're trained in CPR and you've performed 30 chest compressions, open the child's airway using the head-tilt, chin-lift maneuver.

- Place your palm on the child's forehead and gently tilt their head back.
- With the other hand, gently lift the chin forward to open the airway.

Breathing: Breathe for the child

Follow these steps for mouth-to-mouth breathing for a child.

1. After using the head-tilt, chin-lift maneuver to open the airway, pinch the child's nostrils shut. Cover the child's mouth with yours, making a seal.
2. Breathe into the child's mouth for one second. Watch to see if the chest rises. If it rises, give a second breath. If the chest doesn't rise, repeat the head-tilt, chin-lift maneuver. Then give the second breath. Be careful not to provide too many breaths or to breathe with too much force.
3. After the two breaths, begin the next cycle of compressions and breaths right away. If there are two people available to do CPR on the child, change rescuers every two minutes — or sooner if a rescuer is tired — and give 1 to 2 breaths every 15 compressions.
4. As soon as an AED is available, follow the device's directions. Use pediatric pads for children older than 4 weeks and up to age 8 years. If pediatric pads aren't available, use adult pads. Give one shock, then start CPR again — starting with chest compressions — for two more minutes before giving a second shock. If you're not trained to use an AED, a 911 operator or another emergency medical operator may be able to give you directions.

Continue until the child moves or help arrives.

To perform CPR on a baby 4 weeks old or older

Cardiac arrest in babies is usually due to a lack of oxygen, such as from choking. If you know that the baby has an airway blockage, perform first aid for choking. If you don't know why the baby isn't breathing, perform CPR.

First, study the situation. Touch the baby and watch for a response, such as movement. Don't shake the baby.

If there's no response, call 911 or your local emergency number, then start CPR right away.

Follow the compressions, airway and breathing method for a baby under age 1. Do not follow this procedure for newborns, which include babies up to 4 weeks old.

If you saw the baby collapse, get an AED, if available, before starting CPR. If you're with another person who can help, have that person call for help right away and get the AED while you stay with the baby and perform CPR.

Compressions: Restore blood flow

1. Place the baby on their back on a firm, flat surface, such as a table or floor.
2. 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.
3. Gently compress the chest about 1.5 inches (4 centimeters).
4. Count aloud as you push in a fairly rapid rhythm. You should push at a rate of 100 to 120 compressions a minute, just as you would when giving an adult CPR.

Airway: Open the airway

- After 30 compressions, gently tip the head back by lifting the chin with one hand and pushing down on the forehead with the other hand.

Breathing: Breathe for the baby

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. Gently puff a breath 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 baby's chest still doesn't rise, continue chest compressions.
4. Give two breaths after every 30 chest compressions. If two people are doing CPR, give 1 to 2 breaths after every 15 chest compressions.
5. Continue CPR until you see signs of life or until medical help arrives.

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