



# CPR / AED Certification Class

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## CPR / AED CERTIFICATION CLASS

# Introduction

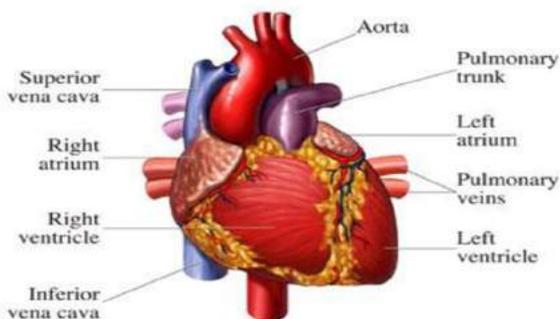
### Welcome to our CPR certification class!

Cardiovascular disease is the leading cause of death in the United States as stated by the CDD (Centers for Disease Control and Prevention). Knowledge of CPR or Cardiopulmonary Resuscitation means the difference between life and death for people who have had a heart attack, a stroke, are choking, have drowned or have gone into cardiac arrest. When a person has lost consciousness, has no pulse and isn't breathing, CPR should begin immediately.

To perform CPR properly, knowing the right way to give chest compressions is key. The American Heart Association has verified that compression only style CPR is just as effective as techniques that require mouth-to-mouth breathing

**Note:** It only takes 10 minutes without oxygen to the brain for death to occur; only 6 to 10 minutes for brain damage to occur and only 4 to 6 minutes for brain damage to be possible. CPR, if administered within 0 to 4 minutes, can prevent brain damage and death.

### Human Heart



## What is CPR?

The heart is a vital organ that pumps blood through the body and to the brain, supplying a steady flow of oxygen. Cardiac arrest stops the heart, the pulse and breathing functions, depriving vital organs and the brain of the oxygen they so desperately need. Cardiopulmonary Resuscitation, known as CPR, is when an outside person takes over for a person's heart, using chest compressions to pump the oxygen rich blood to the vital organs and the brain.

Survival rates are dramatically increased if a victim has CPR, receives controlled stimulation from an AED device (Automated External Defibrillator) and with the fast arrival of trained emergency medical technicians or EMTs to provide greater assistance.

Note: Call 911 before beginning CPR or any other lifesaving techniques, as getting the Emergency Response System active and the EMTs on their way is the priority.

The American Heart Association (AHA) and Emergency Cardiovascular Care (ECC) changed the sequence for applying CPR. CPR application was updated from A-B-C (Airway, Breathing, Compressions) to C-A-B (Compressions, Airway, Breathing). The reason is for quicker compression application.

## Recommendation

Rescuers who aren't fully trained should provide CPR in the compression only style, which is easily instructed over the phone by emergency operators.

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## The Good Samaritan

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Most countries have acts or laws in place that pertain to people who do unsolicited good deeds for those who are ill, in peril or injured so that they can help without fear of retribution if something goes wrong. As long as the rescuer is acting without expectation of compensation or reimbursement on a voluntary basis, they will be legally protected. Every second counts when it comes to aiding someone in need of CPR. Unless there are extreme circumstances, call 911 and start CPR right away.

**Note:** The American Heart Association has said that deep, rapid chest compressions work just as well on cardiac arrest victims as standard CPR and can save a life, even if administered by inexperienced people.

### Prior to performing CPR

Prior to performing CPR, make sure the victim isn't in danger and that you won't be putting yourself in danger by rescuing them. An example of this is someone who is on or near high voltage lines. Either take steps to eliminate the risk or move the victim, whichever is safest. If the situation cannot be resolved, call 911 immediately.

Determine if the victim is conscious; finding a pulse can lose precious seconds, so it is best to call out, asking "Are you okay?" and repeating if necessary. If there is no response, call 911 right away and start CPR by initiating Circulation, Airway and Breathing steps (C-A-Bs). If possible, enlist bystanders for help in calling 911 and start CPR as soon as possible.



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## Adult & Adolescent - CPR

### Activation of Emergency Response System

Send someone else, if possible, to activate the Emergency Response System by calling 911 and begin CPR immediately. If there is an AED nearby, follow the instructions for use and try that route of resuscitation first. If alone and without a mobile phone, leave the victim to retrieve the AED and call 911.

Remember, C-A-B stands for Compressions, Airway, Breathing.

### CPR for Adults & Adolescents

**Scene Safety and Recognition of Cardiac Arrest:** Check the scene for safety issues for both the victim and the rescuers. Check the victim for responsiveness, for breathing and if they are gasping. At the same time, try to find the pulse within 10 seconds of arrival for no longer than a 5 second duration.

**Check Pulse:** Find the pulse by using the index and third fingers on the side of the neck, against the windpipe where the carotid artery is located. Alternatively, use the same two fingers on the victim's wrist directly below the thumb location.



### Adult and Adolescent Compressions (Circulation) – C of CAB

Chest compressions are the outside means to assist a victim by manually pumping their heart when it has stopped. Hand placement on the victim's chest is vitally important, as compressing the incorrect place will not be effective. Compressions should be hard and the release of the chest should be fast.

**Chest Compression Tempo:** The Bee Gees' song "Stayin' Alive" has the perfect tempo for CPR compressions.

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## Compression-Ventilation Ratio without Advanced Airway

The victim should be on a solid surface, not a bed or sofa, for maximum effectiveness of CPR. The lower portion of the breastbone (flat bone down the center of the chest where all the ribs are connected) is the proper location for chest compressions. Feel for the end of the breastbone and locate hands together halfway between there and where the neck begins. Lock elbows and press down with your body weight on the victim's chest, compressing it at least 2 inches (5 cm), releasing immediately. Do not allow yourself to lean on the victim between compressions to allow for the chest to rise back into position. Interruptions are okay, but none lasting longer than 10 seconds or you will put the victim at risk.

**Note:** The 2 inch (5 cm) compression amount is vital when performing CPR on adolescents and adults, as is the release of the chest after compression and the rate of the compressions. Compressions should be performed at a rate of 100 to 120 each minute. Two rescuers are better than one, sharing the task of chest compressions and other rescue tasks or with the second rescuer performing mouth-to-mouth, which should be at a 30:2 ratio to the chest compressions; for every 15 compressions, give one rescue breath.

**Chest Compression Fraction:** This represents the total percentage of time spent performing resuscitation during cardiac arrest. Minimize any interruptions in chest compressions to reach the chest compression fraction goal of at least 60 percent. In other words, over a 30 minute period of time, spend at least 18 minutes performing chest compressions.

## Compression-Ventilation Ratio with Advanced Airway

While performing continuous chest compressions at the rate of 100 to 120 per minute, one breath is provided every 6 seconds for a rate of 10 breaths per minute.

## Clear the Airway – A of CAB for Adults & Adolescents

**Airway:** With the victim on their back on a solid surface, kneel next to their shoulder area. Rest the palm of one hand on the victim's forehead and gently lift the chin with your fingertips of the other hand to tilt the head back. Place your cheek next to the victim's mouth and look at the chest for any movement, feel for any breath near your face and listen for any sounds from the victim. If the victim shows no signs of life, begin rescue breathing.

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### Mouth-to-Mouth – B of CAB for Adults & Adolescents

**Rescue breathing:** Known as mouth-to-mouth resuscitation to many people, is performed just after confirming that there is no sign of life in the victim. An airway has been formed by tilting the head back and now is the time to pinch the victim's nose shut, the first step in sealing the airway. Completely cover the victim's mouth with your own, completing the airway seal, and blow until the victim's chest inflates. If the chest does not inflate, readjust the airway, ensuring the head is tilted back and the nose and mouth are sealed. Repeat the rescue breath.

**Once rescue breathing has started, continue the C-A-Bs:** Compressions, Airway, and Breathing.

#### Rescuers should never:

- Compress too slowly, less than 100 beats per minute or too quickly, more than 120 beats per minute
- Compress less than 2 inches (5 cm) or more than 2.4 inches (6 cm)
- Lean their body on the victim during compressions
- Allow interruptions more than 10 seconds long during compressions
- Breathe too forcefully or too quickly during rescue breathing



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## Child (Age 1 Year to Puberty) - CPR

### When to Activate Emergency Response System

**Witnessed Collapse:** If there has been a witness to the victim's collapse, follow the CPR instructions outlined for adults and adolescents.

**Un-witnessed Collapse:** If no one has seen what happened to the victim, follow the CPR instructions outlined for adults and adolescents for two minutes before leaving the victim to activate the Emergency Response System and retrieve the AED equipment, unless there is another bystander. Return and resume CPR or use the AED, if available.



### CPR for Children (Age 1 Year to Puberty)

**Scene Safety and Recognition of Cardiac Arrest:** Check the scene for safety issues for both the victim and the rescuers. Check the victim for responsiveness, for breathing and if they are gasping. At the same time, try to find the pulse within 10 seconds of arrival for no longer than a 5 second duration.

**Check Pulse:** Find the pulse by using the index and third fingers on the side of the neck, against the windpipe where the carotid artery is located. Alternatively, use the same two fingers on the victim's wrist directly below the thumb location.



## CPR / AED CERTIFICATION CLASS

### Child Compressions (Circulation) – C of CAB

Circulation: Chest compressions are the outside means to assist a victim by manually pumping their heart when it has stopped. Hand placement on the victim's chest is vitally important, as compressing the incorrect place will not be effective. Compressions should be hard and the release of the chest should be fast.

**Chest Compression Tempo:** The Bee Gees' song "Stayin' Alive" has the perfect tempo for CPR compressions.

### Compression-Ventilation Ratio without Advanced Airway

The victim should be on a solid surface, not a bed or sofa, for maximum effectiveness of CPR. In child victims, you may be able to use one hand rather than two for the chest compressions. For smaller children, it is recommended that one hand only be used for safety.

The lower portion of the breastbone (flat bone down the center of the chest where all the ribs are connected) is the proper location for chest compressions. Feel for the end of the breastbone and locate the hand or hands together halfway between the end of this bone and where the neck begins. Lock elbows and press down with your body weight on the victim's chest, compressing it at least 2 inches (5 cm), releasing immediately. Do not lean on the victim between compressions to allow for the chest to rise back into position. Interruptions are okay, but none lasting longer than 10 seconds or you will put the victim at risk.

**Note:** The 2 inch (5 cm) compression amount is vital when performing CPR on adolescents and adults, as is the release of the chest after compression and the rate of the compressions. Compressions should be performed at a rate of 100 to 120 each minute. Two rescuers are better than one, sharing the task of chest compressions and other rescue tasks or with the second rescuer performing mouth-to-mouth, which should be at a 30:2 ratio to the chest compressions; for every 15 compressions, give one rescue breath.

**Chest Compression Fraction:** This represents the total percentage of time spent performing resuscitation during cardiac arrest. Minimize any interruptions in chest compressions to reach the chest compression fraction goal of at least 60 percent. In other words, over a 30 minute period of time, spend at least 18 minutes performing chest compressions.

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### Compression-Ventilation Ratio with Advanced Airway

While performing continuous chest compressions at the rate of 100 to 120 per minute, one breath is provided every 6 seconds for a rate of 10 breaths per minute.

### Clear the Airway – A of CAB for Adults & Adolescents

**Airway:** With the victim on their back on a solid surface, kneel next to their shoulder area. Rest the palm of one hand on the victim's forehead and gently lift the chin with your fingertips of the other hand to tilt the head back. Place your cheek next to the victim's mouth and look at the chest for any movement, feel for any breath near your face and listen for any sounds from the victim. If the victim shows no signs of life, begin rescue breathing.

### Mouth-to-Mouth – B of CAB for Adults & Adolescents

**Rescue breathing:** Known as mouth-to-mouth resuscitation to many people, is performed just after confirming that there is no sign of life in the victim. An airway has been formed by tilting the head back and now is the time to pinch the victim's nose shut, the first step in sealing the airway. Completely cover the victim's mouth with your own, completing the airway seal, and blow until the victim's chest inflates. If the chest does not inflate, readjust the airway, ensuring the head is tilted back and the nose and mouth are sealed. Repeat the rescue breath.

**Once rescue breathing has started, continue the C-A-Bs:** Compressions, Airway, and Breathing.

#### Rescuers should never:

- Compress too slowly, less than 100 beats per minute or too quickly, more than 120 beats per minute
- Compress less than 2 inches (5 cm) or more than 2.4 inches (6 cm)
- Lean their body on the victim during compressions
- Allow interruptions more than 10 seconds long during compressions
- Breathe too forcefully or too quickly during rescue breathing

## CPR / AED CERTIFICATION CLASS

## Infant (Age Less than 1 Year, Excluding Newborns) - CPR

### When to Activate Emergency Response System

**Witnessed Collapse:** If there has been a witness to the victim's collapse, follow the CPR instructions outlined for adults and adolescents.

**Un-witnessed Collapse:** If no one has seen what happened to the victim, follow the CPR instructions outline for adults and adolescents for two minutes before leaving the victim to activate the Emergency Response System and retrieve the AED equipment, unless there is another bystander. Return and resume CPR or use the AED, if available.

### CPR for Infants (Less than One Year Old, Excluding Newborns)

**Scene Safety and Recognition of Cardiac Arrest:** Check the scene for safety issues for both the victim and the rescuers. Check the victim for responsiveness, for breathing and if they are gasping. At the same time, try to find the pulse within 10 seconds of arrival for no longer than a 5 second duration.

**Check Pulse:** Find the pulse by using the index and third fingers on the inside of the upper arm of the infant between the shoulder and elbow, which is the brachial artery.

### Infant Compressions (Circulation) – C of CAB

**Circulation:** Chest compressions are the outside means to assist a victim by manually pumping their heart when it has stopped. Hand placement on the victim's chest is vitally important, as compressing the incorrect place will not be effective. Compressions should be hard and the release of the chest should be fast. Perform CPR on infants with extreme care and caution, as they are much more fragile at this age.

**Chest Compression Tempo:** The Bee Gees' song "Stayin' Alive" has the perfect tempo for CPR compressions.

**One Rescuer:** Locate the victim's nipples, and locate two fingers in the center of them, just below the center of the infant's chest. Keep to the 100 to 120 compressions per minute pace and the same 30:2 compressions to rescue breath ratio. Compress the chest approximately 1/3 of the infant's body circumference (distance around) or about 1.5 inches (4 cm).

**Two Rescuers:** Rescuer One should hold the infant and place their thumbs in the location instructed on the victim's chest to give compressions while Rescuer Two uses a one-way valve device over the victim's mouth and nose. A ratio of 15:2 chest compressions to rescue breaths should be the standard, giving one breath every 6 seconds for a rate of 10 breaths per minute.

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### Compression-Ventilation Ratio without Advanced Airway

- One Rescuer – 30:2
- Two or more Rescuers – 15:2

### Compression-Ventilation Ratio with Advanced Airway

- Continuous compressions at a rate of 100-120 compressions per minute
- One breath every 6 seconds for a rate of 10 breaths per minute

### Clear the Airway – A of CAB for Infants

Airway: With the infant victim on their back on a solid surface, kneel next to their shoulder area. Rest the palm of one hand on the victim's forehead and gently lift the chin with your fingertips of the other hand to tilt the head back. Place your cheek next to the victim's mouth and look at the chest for any movement, feel for any breath near your face and listen for any sounds from the victim. Check for the pulse under the upper arm. If the victim shows no signs of life, begin rescue breathing.

### Mouth-to-Mouth – B of CAB for Infants

**Note:** Use care, as breathing into an infant will require less force than breathing into an adult or child.

**Breathing:** Place your entire mouth over the infant's mouth and nose to form a seal prior to breathing the first puff into the infant. Use less breath than for an older child or an adult. After the infant's chest settles back into place, repeat a second breath. Each breath given should last for one second. If the infant's chest does not rise, check the airway for blockages and adjust the airway if necessary before trying again, making sure to complete the seal around the infant's nose and mouth at the same time.

**Once rescue breathing has started, continue the C-A-Bs:** Circulation, Airway, and Breathing.

#### Rescuers should never:

- Compress too slowly, less than 100 beats per minute or too quickly, more than 120 beats per minute
- Compress less 1.5 inches (4 cm)
- Lean their body on the victim during compressions
- Allow interruptions more than 10 seconds long during compressions
- Breathe too forcefully or too quickly during rescue breathing

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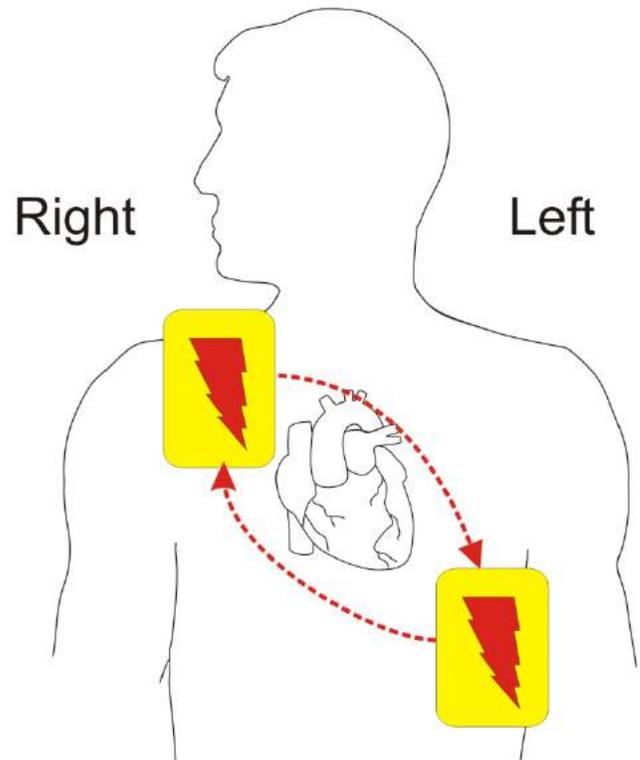
## Automated External Defibrillator (AED)

### When to Utilize an AED

While CPR is an important life-saving technique, an AED can restart a victim's heart and return the rhythm to a normal level. After CPR has been performed, if the victim is still not responding and breathing for themselves, the AED should be utilized. Failure of the AED to regain consciousness in the victim should prompt another round of CPR. Before performing CPR or using an AED, it is critical to call 911 or any Emergency Medical Service (EMS).

### How to Use an AED

Use the "on" button or lever to turn on the AED. Remove the victim's clothing covering the chest, arms and abdomen completely, whether the victim is male or female. Dry the chest area if necessary. Attach the AED pads to the bare skin of the chest, using the appropriate system for children and adults. The left pad should be placed under the armpit on the victim's left side, to the left of the nipple. The right pad should be placed under the collarbone on the victim's right side, on the chest. Any implanted devices should be avoided by at least one inch when pads are placed. Medication patches applied to the chest area should be removed if they cannot be avoided. Clear away any debris or water prior to proceeding to the next steps.



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### AED for Infants

Avoid touching the pads when placing them; one may be placed on the back of the infant if required.

**How to connect the wiring:** Without touching the victim, let the defibrillator process analyze the patient's heart rhythm. If this doesn't automatically initiate the analyze process, press the analyze button on the AED. Make sure everyone and everything is clear of the victim. When instructed to do so by the AED screen, press the shock button.

New AED models administer one shock while older models may shock up to three times. If the victim has not regained a pulse after the shock process, perform CPR for two minutes.

**Note:** Medical training is recommended prior to using an AED.



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### Standard - CPR / AED Review

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#### CPR Application (Adult, Child, Infant)

Ask the victim if they are okay prior to beginning CPR processes. Keep in mind that the chest compressions to rescue breaths ratio is 30:2. Use your senses to feel, look and listen for breathing. Check for any airway blockages. These steps can be performed at the same time.

#### Infant CPR (Age Less Than 1 Year, Excluding Newborns)

- Witnessed: Call 911 or have another person call
- Un-Witnessed: Perform CPR for 2 minutes then call 911 or have another person call
- “Stayin’ Alive” compression tempo, 100 to 120 per minute
- C-A-Bs – Circulate, Airway, Breathing CPR Steps
- Compress chest 1.5 inches (4 cm) to approximately 1/3 diameter of the chest
- 30:2 chest compressions over rescue breaths for single rescuer; 15:2 for two rescuers
- Seal infant’s mouth and nose with mouth
- Two fingers on chest of victim for single rescuer; two thumbs for two rescuers
- Use AED, if available, as soon as possible

#### Child CPR (Age 1 Year to Puberty)

- Witnessed: Call 911 or have another person call
- Un-Witnessed: Perform CPR for 2 minutes then call 911 or have another person call
- “Stayin’ Alive” compression tempo, 100 to 120 per minute
- C-A-Bs – Circulate, Airway, Breathing CPR Steps
- Compress chest 2 inches (5 cm) to approximately 1/3 diameter of the chest
- 30:2 chest compressions over rescue breaths for single rescuer; 15:2 for two rescuers
- Use AED, if available, as soon as possible

#### Adult & Adolescent CPR (Puberty & Older)

- Check for signs of life
- Call 911 or have another person call
- “Stayin’ Alive” compression tempo, 100 to 120 per minute
- C-A-Bs – Circulate, Airway, Breathing CPR Steps
- Compress chest 2 inches (5 cm) in depth
- 30:2 chest compressions over rescue breaths for one or two rescuers
- Use AED, if available, as soon as possible

*Congratulations on finishing our CPR certification class. Next, let’s test your knowledge.*

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