



CPR AED MANUAL



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BASIC CPR/AED CONCEPTS

Chest compressions are the most important part of CPR. They create critical blood flow of oxygen and nutrients to the heart and brain, which keeps the victim alive until advanced care can take over.

The compression rate for all victims is at least 100-120/min. The depth of compressions is at least 2 inches (5 cm) for an adult and one-third the depth of the chest for children and infants. One-third the depth of a child's chest is about 2 inches (5 cm) and one third of an infant's chest is about 1.5 inches (4 cm)

Start chest compressions within 10 seconds of recognition of cardiac arrest

Don't stop CPR until advanced help takes over. Limit interruptions during CPR. Anytime you are not compressing circulation stops. Try to limit interruptions in compressions to less than 10 seconds.

Avoid excessive ventilation, causing gastric inflation (filling the victim's stomach with air) by giving slow and normal breaths that only make the chest rise

CIRCULATION (Chest Compressions)

KEY NOTES:

- *Compression rate for all victims is at least 100-120 compressions per minute. It's important to go FAST and PUSH HARD!!*
- *Allow full chest recoil (reload) to allow the heart to fill completely with blood. This will help to create maximum blood circulation*

WARNING!

The first compressions on any adult's chest will cause cracking, snapping, and popping. You will hear and feel this as you are dislocating the victim's sternum. Breaking apart the cartilage and connective tissue to separate the sternum is needed in order to achieve an effective compression depth for high quality CPR. If revived, a victim can heal from this.

ADULT and CHILD COMPRESSIONS (1 rescuer)

ADULT (8 Yrs of age and Older)

Depth: 2-2.4 inches (About 5 cm)

Rate: 100-120/min

Compressions: 30

Technique: Two Hands

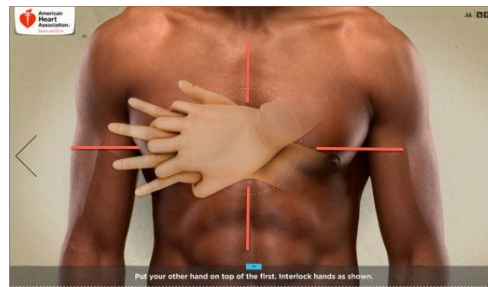
CHILD (1-8 Yrs of age OR 1-55 lbs)

Depth: 2 inches

Rate: 100-120/min

Compressions: 30

Technique: Two Hands



Hands in BETWEEN nipples, on the lower half of the sternum

ADULT and CHILD CHEST COMPRESSIONS

1. Position yourself at the victim's side.
2. Make Sure the victim is lying face up on a firm, flat surface.
3. Place the heel of one hand on the center of the victim's chest on the lower half of the breastbone (nipple line and sternum line).
4. Place the heel of other hand on top of the first hand.
 - It's okay to use two hands on a child
5. Straighten your arms and position your shoulders directly over your hands.
6. Push HARD and FAST. Press straight down on the victim's breastbone.
 - You can't measure inches when doing chest compressions so just hit the bottom of a victim's chest. The heart is like a sponge; the more you compress it, the more blood you will circulate. Deep compressions = a lot of blood flow!! BIGGEST MISTAKE made is doing shallow and slow compressions = little blood flow.

7. After each compression, allow the chest to fully reload for maximum circulation.
8. Perform 30 compression in a row. Minimize interruptions.

INFANT CHEST COMPRESSIONS (1 Rescuer)

INFANT (Birth – 1 yrs of age)

Depth: 1.5 inches (About 4 cm)

Rate: 100-120/min

Compressions: 30

Technique: Two fingers



Fingers BELOW the nipples, on the center of the chest

INFANT CHEST COMPRESSIONS

1. Place the infant on a firm, flat surface.
2. Position yourself at the infant's side.
3. Place 2 fingers in the center of the infant's chest just below the nipple line. Do not press on the bottom of the breastbone.
 - You can't measure inches when doing chest compressions so just hit the bottom or the resistance point on the infant's chest. BIGGEST MISTAKE made is not going deep enough and performing shallow compressions because you are fearful of hurting the infant. REMEMBER deep compressions = a lot of blood flow!
4. Push HARD and FAST. Press straight down on the infant's breastbone.
5. After each chest compression, allow the chest to fully reload for maximum circulation.
6. Perform 30 chest compressions. Minimizing interruptions

AIRWAY

KEY NOTES:

- *A victim's airway must stay open or be opened in order for a person to breathe*
- *Opening a victim's airway and keeping it open, allows the air given from breaths to fill the victim's lungs.*
- *Head-tilt-chin lift is the preferred method for opening a victim's airway*

ADULT CHILD and INFANT Head-Tilt-Chin lift

1. Place one hand on the victim's forehead and push with your palm to tilt the head back.
2. Place the fingers of the other hand under the bony part of the chin.
3. Lift the chin to bring the jaw forward.

WARNING!

Don't place fingers into the soft tissue under the chin to lift. Only place fingers on the bony part of the chin to lift the jaw.

WARNING! *Don't lift infant's head beyond the neutral position. If you go beyond the neutral position you may hyperextend the infant's airway and it may become blocked.*

BREATHING (Breaths)

KEY NOTES:

- **IMPORTANT!** Only give 2 breaths or two attempts at breaths. If both your attempts fail, return to chest compressions.
 - If both attempts fail, the victim may have an obstructed airway. If something is obstructing the airway chest compressions can always help dislodge it.
 - DO NOT PERFORM A "BLIND" FINGER SWEEP! Only remove objects that can be seen and removed.

- Chest rise determines a normal breath. Every person has a different size of lungs. The best way to give and determine a normal breath for every victim is to watch for his or her chest to rise. Once you see any movement in their chest, STOP and cut your breath off!
- Breaths should be given to any victim and especially to children and infants. If a barrier device isn't available and you don't feel safe, you can use chest compressions only. Once a barrier device does become available, give breaths.

WARNING!

Breaths that are too quick, too powerful, and too long, may cause gastric inflation (filling the victims stomach with air). THIS WILL CAUSE THE VICTIM TO VOMIT.

MOUTH-TO-MOUTH

WARNING!

Mouth-to-mouth breathing is a possible hazard to your health. Compressions only CPR can always be performed if a barrier device is not available.

1. Position yourself at the victim's side.
2. Make sure the victim's airway is open. (Head-tilt-chin lift)
3. Pinch the victim's nostrils closed with your thumb and index finger using the palm of the hand on the forehead.
4. Seal your mouth around the victim's mouth, creating an airtight seal.
5. Give **1** slow breath watching for the chest to rise. (Remember once you see the chest rise cut that breath off!)
6. If your breath fails and you can't see the chest rise, then reopen the airway by repositioning the head using the head-tilt-chin lift.
7. Give a **second** breath watching for the chest to rise. (Remember, regardless of whether your second breath works or fails you should immediately return to chest compressions!)

REMEMBER

INFANT MOUTH-TO-MOUTH

- You will place your mouth over the infant's mouth AND nose to create an airtight seal
- Blow into the infant's nose AND mouth while looking for chest rise

WARNING!

The amount of air usually needed to fill an infant's lungs is the amount of air you can fill in the cheeks of your mouth. The breaths are more like puffs.

MOUTH-TO-MASK (Barrier Device)

- When a barrier device is available the rescuer should always give breaths
 - Masks have a 1-way valve that protects the rescuer by releasing exhaled air, blood, or bodily fluids away from the rescuer.
1. Position yourself at the victim's side.
 2. Place the mask on the victim's face. Make sure the top of the mask is resting on the bridge of the nose.
 3. Seal the mask against the face.
 - a. Place one hand on the top of the mask. Using your thumb and index finger push on the edge of the mask to seal it against the face.
 - b. Place your second hand on the bottom of the mask. Pinch your thumb against the edge of the mask and your index finger against the bony part of the victim's jaw.
 4. With the mask securely sealed on the victim's face perform a head-tilt-chin lift to open the airway.
 5. Give **1** slow breath watching for the chest to rise. (Remember once you see the chest rise cut that breath off!)
 6. If your breath fails and you can't see the chest rise, then reopen the airway by repositioning the head using the head-tilt-chin lift.
 8. Give a **second** breath watching for the chest to rise (Remember, regardless of whether your second breath works or fails you should immediately return to chest compressions!)

INITIAL CPR STEPS (When to start C-A-B)

Now let's go to the beginning...when to start your compressions and give breaths?

OVERVIEW (Quick Review)

1. **Assess** the victim for response. If there is no response, shout for help!

2. **Activate the emergency response system (911)** and get an AED (defibrillator) if available and return the victim.
3. **Look for normal breathing** (no longer than 10 seconds)
4. If the victim is not breathing or is only gasping start your chest compressions and breaths **(C-A-B sequence)**

ASSESS

WARNING!

If you are the first responder on the scene make sure the scene is safe. Do not allow yourself to become a victim as well. If the scene is not safe, stay away and activate the emergency response system (911). If you feel the victim is in a dangerous environment where more harm will come to them, you can move them out of the scene if it is safe for you to do so.

1. Make sure the scene is safe for you and the victim.
2. Tap the victim on the collarbones and shout **“ARE YOU OKAY?”**
3. Check to see if the victim is breathing NORMALLY

- ! *IF THE VICTIM DOES NOT WAKE UP* activate the emergency response system (911)
- ! *IF THE VICTIM IS NOT BREATHING* activate the emergency response system (911)
- ! *IF THE VICTIM IS **NOT** BREATHING NORMALLY OR ONLY GASPING* activate the emergency response system (911). **A SNORT, SNORE, OR GROAN IS NOT normal breathing. This is a sign of cardiac arrest. Activate the emergency response system (911)**

EMERGENCY RESPONSE SYSTEM

PEOPLE AROUND

1. If you find an unresponsive victim and you think there are other people around shout, **“HELP!”**
2. When another responder arrives tell them to activate the emergency response system (911) and get an AED (defibrillator) if available.

ALONE (cell phone)

1. If you are alone and find an unresponsive victim and you have your cell phone, activate the emergency response system (911), set the phone down (if possible turn on the speaker phone), check the victim for breathing and begin your C-A-B sequence.

ALONE (NO cell phone)

1. If you find an unresponsive victim but are alone and think you can get help within 2 minutes, leave, activate the emergency response system (phone, cell phone, or person), grab the AED (if available)
2. Return to the victim and begin your C-A-B sequence.

WARNING!

If you think getting help it will take you longer than 2 minutes, activate the emergency response, DO NOT LEAVE. Check for breathing and begin your C-A-B sequence, perform 5 cycles of compressions and breaths FIRST before leaving.

WARNING!

If the victim is a CHILD or INFANT and you find them DO NOT LEAVE! Check for breathing and begin your C-A-B sequence, perform 5 cycles of compressions and breaths FIRST before leaving.

LOOK FOR BREATHING

ADULT, CHILD, AND INFANT

1. Look for breathing for no longer than 10 seconds. You do this by looking for “chest rise and fall”
2. If you do not see the victim breathing, or if they are only gasping, try to remove clothing from the chest and begin CPR.

WARNING!

**Chest compressions, if needed, are always started within 10 seconds AFTER activating the emergency response system or calling 911.
You should take no more than 10 seconds to check for breathing**

WARNING!

It can be difficult to determine the presence or absence of breathing. If there is any doubt in your mind on whether the victim is breathing normally or only gasping, START CPR!! Starting chest compressions on someone who was breathing will not hurt the heart or stop it!! Hopefully the victim will respond!

DEFIBRILLATION (AED)

AED is an automated external defibrillator. AED's can be located in hospitals, airports, malls, public schools, courthouses, libraries, hotels, churches, golf courses, and a variety of other locations. Each AED can be different by make, model, and color. The training and information you receive can be applied to the use of every AED. Make sure you become familiar with the proper use of the AED in your facility.

FIBRILLATION vs DEFIBRILLATION

When a person is unresponsive due to cardiac arrest or other possible issues, their heart can go into ventricular **fibrillation**. This is when the heart muscles quiver and do not contract together to pump blood; the heart is just shaking in their chest. An AED delivers an electric shock (**defibrillation**) to stop the heart from quivering, which can reset the heart back to its normal rhythm so it can pump blood.

i.e. When your computer freezes on you, you need to shut it down and reboot it for it to work properly again. This is the same concept for use of an AED on a person's heart.

OVERVIEW (Quick Review):

These steps apply to all make and models of AED's. There are slight differences between AED's but they all basically work the same.

1. POWER ON the AED
2. ATTACH PADS
3. SHOCK if Advised
4. Begin CPR

POWER ON

1. Turn the power on (some defibrillators will power on automatically when you open the lid or case).

- “A” in AED stands for Automated. When you power on the AED it will talk and guide you through all the steps. Be sure you listen to the AED so you don’t forget anything.

ATTACH PADS

1. Peel backing away from the AED pads
2. Attach the adhesive AED pads to the victim’s BARE chest
 - Look at the pictures on the pads to help guide you for pad placement. Pads have to be touching the skin to analyze and shock the victim.
 - Place one AED pad on the upper right chest (directly below collar bone)
 - Place one AED pad on the left side of chest (left of nipple, few inches below armpit)
3. Once the AED prompts you to “clear”, stop CPR, clear the victim and be sure NO ONE is touching the victim.
 - You will know when the pads are attached correctly when the AED tells you to “clear for analyze”
 - Some AED’s may take about 5 to 15 seconds to analyze

IMPORTANT!

Make sure NO ONE is touching the victim while the AED is ANALYZING, not even the rescuer in charge of holding the victim’s airway and giving breaths. If any rescuer is touching the victim while the AED is analyzing it might pick up the rescuer’s pulse rather than the victim’s pulse. If any rescuer is performing CPR while analyzing it will give a false reading on the victim’s heart rhythm.

REMINDER!

AED pads need to be placed in the proper areas on the chest. Two pads placed in the proper areas on a victim’s chest will ensure the shock goes through the heart, even if the pads get “flip flopped”, the AED will still work properly.

SHOCK (If the AED advises shock)

1. Clear the victim
 - Yell or state loudly “clear” or “clear the victim”
 - Look and double check to be sure no one is touching the victim
2. Press the **SHOCK** button
 - The shock will cause the victim’s muscles to contract suddenly!! Don’t be alarmed!
3. Immediately RESUME CPR, starting with chest compressions
 - After 2 minutes of CPR (about 5 cycles of compressions and breaths) the AED will re-analyze. Clear the victim and listen to the prompts from the AED

IMPORTANT!

An AED will only advise to shock a victim if needed and therefore should be attached to every victim regardless of the injury or illness.

NO SHOCK (If the AED advises NO shock)

1. Immediately RESUME CPR, starting with chest compressions
 - a. After 2 minutes of CPR (about 5 cycles of compressions and breaths) the AED will re-analyze. Clear the victim and listen to the prompts from the AED

REMINDER!

AED pads should never come off the victim's chest. Once they are applied the AED will re-analyze every 2 minutes.

Special Situations

- Children and Infants
- Two rescuers
- Victim with a hairy chest
- Victim is in water or water is covering the victim's chest
- Victim has a medication patch
- Victim has an implanted defibrillator or pacemaker

Children and Infants (Less than 55LBS which is typically 8 years of age and younger)

If your AED includes a smaller size pad or pediatric dose attenuator, use it. If not, use the standard pads and AED. When placing the standard pads on the infant or child's chest make sure the pads do not touch or overlap. If the pads are touching or overlapping you will have to place one AED pad on the front (center of the chest) and one AED pad on the back (center of the back, between shoulder blades). Compressions will now have to be performed directly on top of the AED pad.

Two rescuers

If there is a second rescuer available during the use of the AED, one rescuer will continue performing CPR, chest compressions and breaths. The second rescuer will have to attach the AED pads while working around the first rescuer who is performing CPR. Tell them to stop CPR and clear the victim once the AED is ready to analyze.

Hairy chest

If the victim has hair on their chest it can create a barrier between the AED pad and the victim's skin. This will not allow the AED to analyze and shock the victim. The AED will then give a "check pads or electrodes" message. Try pressing the pads down firmly. If

this doesn't work you should remove the pads and do one of the following before putting the pads back on.

- Rip the hair off using Epilapad chest hair removal pads
- Shave the victim's hair with a razor
- Trim the hair down with scissors
- Press down firmly again on each pad

REMINDER!

If it is obvious that the amount of hair will be a problem you should try to remove the hair first before attaching the AED pads. This should be done while a second rescuer (if present) continues CPR, not interrupting compressions

Water

Water conducts electricity. Water can divert a shock through the water across the skin and around the heart.

- Pull the victim out of the water (Small puddle, damp ground, snow, and dew on grass is okay)
- If water is covering the victim's chest, quickly wipe the chest before attaching AED pads, making sure a MAJORITY of the water is removed. The chest does not have to be completely dry.

Medication patch (Only if its where the AED pad is placed)

It is okay to use an AED with a medication patch but a medication patch can block the defibrillation shock and can cause small burns to the skin

- Remove the patch and wipe the area clean before attaching the AED pad

Implanted defibrillator or pacemaker (Only if its where the AED pad is placed)

People with high risk for cardiac arrest might have an implanted defibrillator or pacemaker. It is okay to use an AED with a person that has an implanted defibrillator or pacemaker but the device may block the defibrillation shock. It will be a hard lump beneath the skin, which is round or square, and smaller than a deck of cards.

- Avoid placing the AED pad directly over the defibrillator or pacemaker
- Move the AED pad closer to the heart (if possible 1 inch away)

CHOKING

Properly trained rescuers can have the necessary skills for early detection or recognition for a person that is choking. A person that is actually choking will have a severe airway obstruction. There are a few main severe choking symptoms for an (Adult, Child, Infant)

Noise

- No coughing
- No noise or air exchange
- Cannot talk or cry
- May show the “Universal Sign” of choking by clutching the throat

IMPORTANT!

Coughing is NOT choking! That person has air exchange. Do not interfere with the person’s (even an infant’s) own attempt to expel the foreign object, but stay with them to monitor his or her condition.

Color

- Turning blue (cyanosis)
 - Lips
 - Cheeks

Eyes

- Person will be “wide eyed”
- Eyes will water
- They will look scared

Infant

1. Sit or kneel with the infant on your lap
2. Rest the infant facedown on your forearm with the head slightly lower than the chest
 - Support the head and jaw with your hand
 - Make sure your forearm is resting in your lap or on your thigh
3. Quickly deliver up to 5 backslaps forcefully between the infant’s shoulder blades using the heel of your hand.
 - Deliver each slap firmly.
4. After delivering up to 5 backslaps place your hand on the back of the infant’s head and forearm down their spine to support the back. One hand should be supporting the infants neck and jaw and the other supporting the back of the head, creating a sandwich effect with the infant and your forearms.
5. Turn or flip the infant to his or her back holding them face up.
 - Support the back of the head with your hand

- Make sure your forearm is resting in your lap or on your thigh
6. Quickly deliver up to 5 downward chest thrusts in the middle of the their chest, using two fingers (same placement as for chest compressions).
 - Deliver each chest thrust firmly, just like performing compressions.
 7. Repeat! Continue performing up to 5 back slaps and up to 5 chest compressions until the object is removed or the infant becomes unresponsive.

INFANT BECOMES UNRESPONSIVE!

1. Stop giving backslaps. Begin CPR starting with chest compressions!
2. Make sure you call for help and tell someone to get an AED!
3. Each time you finish compressions and BEFORE you give breaths look for the obstructing object. If you see an object and think it can be removed then you should remove it.

REMEMBER!

Breaths are helpful to dislodge or change the angle of the obstructing object

Adult/Child

1. Stand behind the victim and wrap your arms around the victim's abdomen.
2. Make a fist with one hand.
3. Place the thumb side of your fist against the victim's abdomen just slightly above the belly button (your knuckles should be facing upward).
 - Make sure your fist it not too high. You should be well below the breast bone
4. Grab your fist with your other free hand and pull quickly and forcefully up-and-into the victim's abdomen.
 - The motion of abdominal thrusts should look like a Nike swoosh symbol
5. Repeat! Continue performing thrusts until the object is removed from the airway or the victim becomes unresponsive.

ADULT/CHILD BECOMES UNRESPONSIVE!

1. Stop giving abdominal thrusts! Begin CPR starting with chest compressions!
2. Make sure you call for help and tell someone to get an AED!
3. Each time you finish compressions and BEFORE you give breaths look for the obstructing object. If you see an object and think it can be removed then you should remove it.

REMEMBER!

Breaths are helpful to dislodge or change the angle of the obstructing object

Special Situations

- Pregnant or Obese victim
- Children
- Tall victim
- Alone and you are choking

Pregnant or Obese

Move your fist to the center of the victim's chest and perform chest thrusts (pulling straight in) rather than abdominal thrusts. If you are unable to fit your arms around the victim's chest, push them up against a wall, tree, post, something firm, and use both hands pushing straight in on their chest.

Children

Kneel behind the child and perform abdominal thrusts

Tall

Have the victim kneel and you will stand or slightly squat behind them to perform abdominal thrusts. DO NOT stand on anything to perform abdominal thrusts. Having the victim kneel protects them and you if they pass out and become unresponsive.

Alone

If you are alone and begin to choke immediately call 911. Then perform your own abdominal thrusts or drop yourself over the back of a chair. You can even run your abdomen into the edge of a counter or table. Do something to get a firm thrust into your abdomen.

IMPORTANT!

If you are having trouble removing the obstruction you should go outside so someone may be able to see and help you or so advanced care will have access to you once they arrive!

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