Table of Contents

Objectives ............................................................................................................................................................. 3
One Rescuer Adult CPR Sequence.......................................................................................................................... 4
One Rescuer Child CPR Sequence (1 year to Puberty) ...................................................................................... Error! Bookmark not defined.
Common Steps to Operating all AEDs.................................................................................................................. 6
Two Rescuer Adult and Child CPR Sequence With an AED .............................................................................. 7
Healthcare Provider Summary of Steps of CPR for Adults, Children, and Infants ........................................... 9
Recognizing Choking in Adults and Children ...................................................................................................... 10
Relief of Choking in Responsive Adults and Children ....................................................................................... 11
Relief of Choking in Unresponsive Adults and Children ................................................................................... 12
Recognizing Choking in Infants .......................................................................................................................... 13
Relief of Choking in Responsive Infants ............................................................................................................ 14
Relief of Choking in Unresponsive Infants ........................................................................................................ 15
Appendix - CPR Hints........................................................................................................................................ 16
OBJECTIVES

At the end of this class you will be able to:

- Tell the basic steps of CPR for adults and children
- Show the basic steps of CPR for adults and children
- Show the complete sequence for Two Rescuer CPR for adults and children
- Tell the basic steps of CPR for infants
- Show the basic steps of CPR for infants
- Show the complete sequence for Two Rescuer infant CPR
- Show how to relieve choking in the responsive and unresponsive adult, child and infant
- Tell the importance of early defibrillation
- Tell the steps common to the operation of all AEDs
- Show the proper placement of AED electrode pads
- Tell when to press the shock button when using an AED
- Tell why no one should touch the victim while the AED is analyzing the heart rhythm or delivering a shock to the victim
- Tell the proper actions to take when the AED gives a “no shock indicated” or “no shock advised” message
ONE RESCUER ADULT CPR SEQUENCE

Adult BLS Healthcare Providers

1. Unresponsive
   No breathing or no normal breathing
   (i.e., only gasping)

2. Activate emergency response system
   Get AED/defibrillator
   or send second rescuer (if available) to do this

3. Check pulse:
   DEFINITE pulse within 10 seconds?
   
   3A. Definite Pulse
   - Give 1 breath every 5 to 6 seconds
   - Recheck pulse every 2 minutes

4. No Pulse
   Begin cycles of 30 COMPRESSIONS and 2 BREATHS

5. AED/defibrillator ARRIVES

6. Check rhythm
   Shockable rhythm?
   
   7. Shockable
   Give 1 shock
   Resume CPR immediately
   for 2 minutes

   8. Not Shockable
   Resume CPR immediately
   for 2 minutes
   Check rhythm every 2 minutes; continue until
   ALS providers take over or victim starts to move

Note: The boxes bordered with dashed lines are performed
by healthcare providers and not by lay rescuers

© 2010 American Heart Association

Adult BLS Algorithm

Positioning the Victim
- The victim should be in a face up (supine position) and on a hard
  surface before you begin CPR. If an unresponsive victim is not face
  up, roll the victim to a face up position.
- If a victim is not on a hard surface (for example if the victim is in bed),
  place a board or other rigid surface between the victim and the bed.
  If one is not available, move the victim to the floor.
Two Rescuer Compression-Ventilation Ratio for Children

Rescuers should use a 15:2 compression-ventilation ratio for Two Rescuer CPR for child victims for out-of-hospital and in-hospital resuscitation. Children often have respiratory difficulty, which leads to cardiac arrest. Therefore, more frequent ventilations are of greater benefit to children.
### COMMON STEPS TO OPERATING ALL AEDs

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
</table>
| **1** | **POWER ON the AED** (this activates voice prompts for guidance in all subsequent steps).  
- Open the carrying case or the top of the AED.  
- Turn the power on (some devices will “power on” automatically when you open the lid or case). |
| **2** | **ATTACH** electrode pads to the victim’s bare chest.  
- Choose correct pads (adult vs. child) for size/age of victim. Use child pads or child system for children less than 8 years of age if available. **Do not use child pads or child system for victims 8 years and older.**  
- Peel the backing away from the electrode pads.  
- Quickly wipe the victim’s chest if it is covered with water or sweat.  
- Attach the adhesive electrode pads to the victim’s bare chest.  
  - Place one electrode pad on the upper-right side of the bare chest to the right of the breastbone, directly below the collarbone.  
  - Place the other pad to the left of the nipple, a few inches below the left arm pit.  
- Attach the AED connecting cables to the AED box (some are pre-connected). |
| **3** | “Clear” the victim and **ANALYZE** the rhythm.  
- Always clear the victim during analysis. Be sure that no one is touching the victim, not even the person in charge of giving breaths.  
- Some AEDs will tell you to push a button to allow the AED to begin analyzing the heart rhythm; others will do that automatically. The AED may take about 5 to 15 seconds to analyze.  
- The AED then tells you if a shock is needed. |
| **4** | If the AED advises a shock, it will tell you to be sure to clear the victim.  
- Clear the victim before delivering the shock; be sure no one is touching the victim to avoid injury to rescuers.  
  - Loudly state “clear the patient” message, such as “I’m clear, you’re clear, everybody’s clear” or simply “clear.”  
  - Perform a visual check to ensure that no one is in contact with the victim.  
- Press the **SHOCK** button.  
- The shock will produce a sudden contraction of the victim’s muscles. |
| **5** | As soon as the AED gives the shock, begin CPR starting with chest compressions. |
| **6** | After 2 minutes of CPR, the AED will prompt you to repeat steps 3 and 4. |
# Two Rescuer Adult and Child CPR Sequence with an AED

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
</table>
| 1 | **Check for response**: if the victim does not respond and is not breathing normally:  
  - The first rescuer stays with the victim and performs CPR until the AED arrives.  
  - The second rescuer activates the emergency response system and gets the AED. (Either rescuer may operate the AED once it arrives.) |
| 2 | **Check for pulse**: If pulse not definitely felt in 5 to 10 seconds:  
  - Perform chest compressions and prepare to attach the AED:  
    - The first rescuer starts chest compressions while the second rescuer prepares to use the AED.  
    - Remove or move clothing covering the victim’s chest to allow rescuers to provide chest compressions and apply the AED electrode pads. |
| 3 | **Provide 2 breaths using a barrier device** |
| 4 | **Provide sequence of CPR until AED arrives**  
  - One and Two Rescuer Adult CPR, provide 30 compressions to 2 breaths  
  - One Rescuer Child CPR, provide 30 compressions to 2 breaths  
  - Two Rescuer Child CPR, provide 15 compressions to 2 breaths |
| 5 | **Attempt defibrillation with the AED**:  
  - When the AED arrives, place it at the victim’s side near the rescuer who will be operating it. The AED is usually placed on the side of the victim opposite the rescuer who is performing the CPR (Figure 1).  
  - There are 2 exceptions:  
    - For a child who suffered an unwitnessed, out-of-hospital cardiac arrest, complete 5 cycles (or about 2 minutes) of CPR before attaching and using the AED.  
    - For an adult who suffered an unwitnessed, out-of-hospital cardiac arrest and with EMS call-to-arrival interval greater than 4 to 5 minutes, EMS personnel may complete 5 cycles (or about 2 minutes) of CPR before attaching and using the AED. |
| 6 | - **POWER ON** the AED (Figure 2) and follow voice prompts. Some devices will turn on when the AED lid or carrying case is opened.  
  - **ATTACH** the AED:  
    - Select the correct pads for the victim’s size and age (adult vs. child), and/or turn a key or switch to deliver a child shock dose if appropriate.  
    - Peel the backing from the pads.  
    - ATTACH the adhesive pads to the bare skin of the victim’s chest (Figure 3).  
    - Attach the electrode cable to the AED (if not preconnected).  
  - Allow the AED to **ANALYZE** the victim’s rhythm (clear the victim before analysis) (Figure 4). |
- Deliver a **SHOCK** if needed (clear the victim before shock) (Figure 5).
- If no shock is needed and after any shock delivery, **resume CPR** beginning with chest compressions (Figure 6).

**Figure 1.** Second rescuer places AED beside victim

**Figure 2.** Operator turns AED on.

**Figure 3.** Attach electrode pads to the victim and then attach the electrodes to the AED.

**Figure 4.** The operator clears the victim before rhythm analysis.

**Figure 5.** A. The operator clears the victim before delivering a shock. B. When everyone is clear of the victim, the operator presses the SHOCK button.

**Figure 6.** Start CPR beginning with chest compressions.
### Healthcare Provider Summary of Steps of CPR for Adults, Children, and Infants

<table>
<thead>
<tr>
<th>CPR</th>
<th>Adult and Older (Child (puberty and older))</th>
<th>Child (1 year old to puberty)</th>
<th>Infant (Less than 1 year old)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish that the victim does not respond and is not breathing normally</td>
<td>Activate your emergency response system as soon as the victim is found</td>
<td>Lone Rescuer: For Unwitnessed collapse, activate your emergency response system after giving 5 cycles of CPR</td>
<td>Lone Rescuer: For Witnessed collapse, immediately activate emergency response system and get AED</td>
</tr>
<tr>
<td>Check pulse</td>
<td>Carotid pulse (if no pulse, start CPR)</td>
<td>Carotid pulse (if no pulse or pulse is &lt;60 bpm with signs of poor perfusion, start CPR)</td>
<td>Brachial pulse (if no pulse or pulse is &lt; 60 bpm with signs of poor perfusion, start CPR)</td>
</tr>
</tbody>
</table>

**Start CPR**

- **Compression location**
  - Center of the chest on the lower half of the breastbone
  - Just below nipple line on breastbone

- **Compression method**
  - Heel of 1 hand, other hand on top (or 1 hand for small victims)
  - 2 fingers (2 thumb-encircling hands for Two Rescuer CPR)

- **Compression depth**
  - 2 inches
  - 1/3 depth of chest
  - 1 ½ to 2 inches

- **Compression rate**
  - At least 100 per minute

- **Compression ventilation ratio**
  - 30:2 (One or Two Rescuer CPR)
  - 30:2 for One Rescuer CPR
  - 15:2 for Two Rescuer CPR

**Provide Breaths**

- Perform Head Tilt, Chin Lift.
- Give 2 breaths that make the chest rise.
- Each breath should last 1 second.
RECOGNIZING CHOKING IN ADULTS AND CHILDREN

Recognizing Choking in the Responsive Adult and Child

Early recognition of airway obstruction is the key to successful outcome. It is important to distinguish this emergency from fainting, stroke, heart attack, seizure, drug overdose, or other conditions that cause sudden respiratory failure but require different treatment. The trained observer can often detect signs of choking.

<table>
<thead>
<tr>
<th>Mid Airway Obstruction</th>
<th>Severe Airway Obstruction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Signs:</strong></td>
<td></td>
</tr>
<tr>
<td>- Good air exchange</td>
<td>- Poor or no air exchange</td>
</tr>
<tr>
<td>- Responsive and can cough forcefully</td>
<td>- Weak, ineffective cough or no cough at all</td>
</tr>
<tr>
<td>- May wheeze between coughs</td>
<td>- High-pitched noise while inhaling or no noise at all</td>
</tr>
<tr>
<td></td>
<td>- Increased respiratory difficulty</td>
</tr>
<tr>
<td></td>
<td>- Possible cyanosis (turning blue)</td>
</tr>
<tr>
<td></td>
<td>- Unable to speak</td>
</tr>
<tr>
<td></td>
<td>- Clutching the neck with the thumb and fingers, making the universal choking sign</td>
</tr>
<tr>
<td></td>
<td>- Unable to move air</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mild Airway Obstruction</th>
<th>Severe Airway Obstruction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rescuer actions:</strong></td>
<td></td>
</tr>
<tr>
<td>- As long as good air exchange continues, encourage the victim to continue spontaneous coughing and breathing efforts.</td>
<td>- Ask the victim if he or she is choking. If the victim nods yes and cannot talk, severe airway obstruction is present and you must activate the emergency response system.</td>
</tr>
<tr>
<td>- Do not interfere with the victim’s own attempts to expel the foreign body, but stay with the victim and monitor his or her condition.</td>
<td></td>
</tr>
<tr>
<td>- If mild airway obstruction persists, activate the emergency response system.</td>
<td></td>
</tr>
</tbody>
</table>

The public should use the universal choking sign to indicate the need for help when choking.
**RELIEF OF CHOKING IN RESPONSIVE ADULTS AND CHILDREN**

**Relieving Choking in Adults and Children Over 1 Year of Age**

Use abdominal thrusts (the Heimlich maneuver) to relieve choking in adults and children over 1 year of age. Do not use abdominal thrusts to relieve choking in infants.

Give each individual thrust with the intent of relieving the obstruction. It may be necessary to repeat the thrust several times to clear the airway.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stand or kneel behind the victim and wrap your arms around the victim’s waist.</td>
</tr>
<tr>
<td>2</td>
<td>Make a fist with one hand.</td>
</tr>
<tr>
<td>3</td>
<td>Place the thumb side of your fist against the victim’s abdomen, in the midline, slightly above the navel and well below the breastbone.</td>
</tr>
<tr>
<td>4</td>
<td>Grasp your fist with your other hand and press your fist into the victim’s abdomen with a quick upward thrust.</td>
</tr>
<tr>
<td>5</td>
<td>Repeat thrusts until the object is expelled from the airway or the victim becomes unresponsive.</td>
</tr>
<tr>
<td>6</td>
<td>Give each new thrust with a separate, distinct movement to relieve the obstruction</td>
</tr>
</tbody>
</table>
### RELIEF OF CHOKEING IN UNRESPONSIVE ADULTS AND CHILDREN

<table>
<thead>
<tr>
<th>Step</th>
<th>Adult Action</th>
<th>Child Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Activate Emergency Response System</td>
<td>Place Child on a firm flat surface</td>
</tr>
<tr>
<td>2.</td>
<td>Place the adult on a firm flat surface</td>
<td>Open the child’s airway and look for object in the back of the mouth. If the object is visible, remove it. Do not perform a blind finger sweep.</td>
</tr>
<tr>
<td>3.</td>
<td>Open the adult’s airway and look for an object in the mouth. If the object is visible, remove it. Do not perform a blind finger sweep.</td>
<td>Begin CPR with 1 extra step: each time you open the airway, look for the object in the back of the mouth. If you see an object, remove it.</td>
</tr>
<tr>
<td>4.</td>
<td>Begin CPR with 1 extra step: each time you open the airway, look for the object in the back of the mouth. If you see an object, remove it.</td>
<td>After approximately 5 cycles (about 2 minutes) of CPR activate the Emergency Response System.</td>
</tr>
</tbody>
</table>
**Recognizing Choking in Infants**

Recognizing Choking in the Responsive Infant

Early recognition of airway obstruction is the key to successful outcome. The trained observer can often detect signs of choking. Foreign bodies may cause a range of symptoms from mild to severe airway obstruction.

<table>
<thead>
<tr>
<th>Mile Airway Obstruction</th>
<th>Severe Airway Obstruction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Signs:</strong></td>
<td><strong>Signs:</strong></td>
</tr>
<tr>
<td>▪ Good air exchange</td>
<td>▪ Poor or no air exchange</td>
</tr>
<tr>
<td>▪ Responsive and can cough forcefully</td>
<td>▪ Weak, ineffective cough or no cough at all</td>
</tr>
<tr>
<td>▪ May wheeze between coughs</td>
<td>▪ High-pitched noise while inhaling or no noise at all</td>
</tr>
<tr>
<td></td>
<td>▪ Increased respiratory difficulty</td>
</tr>
<tr>
<td></td>
<td>▪ Possible cyanosis (turning blue)</td>
</tr>
<tr>
<td></td>
<td>▪ Unable to cry</td>
</tr>
<tr>
<td></td>
<td>▪ Unable to move air</td>
</tr>
</tbody>
</table>

**Rescuer Actions**

- Do not interfere with the victim’s own attempts to expel the foreign body, but stay with the victim and monitor his or her condition.
- If mild airway obstruction persists, activate the emergency response system.

**Rescuer Actions**

- If the victim cannot make any sounds or breathe, severe airway obstruction is present and you must activate the emergency response system.
## RELIEF OF CHOKING IN RESPONSIVE INFANTS

Relieving Choking in the Responsive Infant  
Clearing an object from an infant’s airway requires a combination of back slaps and chest thrusts.

Follow these steps to relieve choking in a responsive infant:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kneel or sit with the infant in your lap.</td>
</tr>
<tr>
<td>2</td>
<td>If it is easy to do, uncover the infant's chest.</td>
</tr>
<tr>
<td>3</td>
<td>Hold the infant prone (facedown) with the head slightly lower than the chest, resting on your forearm. Support the infant's head and jaw with your hand. Take care to avoid compressing the soft tissues of the infant's throat. Rest your forearm on your lap or thigh to support the infant.</td>
</tr>
<tr>
<td>4</td>
<td>Deliver up to 5 back slaps, place your free hand on the infant's back, supporting the back of the infant's shoulder blades using the heel of your hand. Deliver each slap with sufficient force to attempt to dislodge the foreign body.</td>
</tr>
<tr>
<td>5</td>
<td>After delivering up to 5 back slaps, place your free hand on the infant's back, supporting the back of the infant's head with the palm of your hand. The infant will be adequately cradled between your 2 forearms, with the palm of one hand supporting the face and jaw while the palm of the other hand supports the back of the infant's head.</td>
</tr>
<tr>
<td>6</td>
<td>Turn the infant as a unit while carefully supporting the head and neck. Hold the infant on his back with your forearm resting on your thigh. Keep the infant's head lower than the trunk.</td>
</tr>
<tr>
<td>7</td>
<td>Provide up to 5 quick chest thrusts in the same location as chest compression – just below the nipple line. Deliver chest thrusts at a rate of about 1 per second, each with the intention of creating enough of an “artificial cough” to dislodge the foreign body.</td>
</tr>
<tr>
<td>8</td>
<td>Repeat the sequence of up to 5 back slaps and up to 5 chest thrusts until the object is removed or the infant becomes unresponsive.</td>
</tr>
</tbody>
</table>
Relieving Choking in the Unresponsive Infant

Do not perform blind finger sweeps in infants and children because the foreign body may be pushed back into the airway, causing further obstruction or injury.

If the infant victim becomes unresponsive, you will stop giving back slaps and will begin CPR. Chest compressions give effective pressure in the chest and may be able to relieve the obstruction.

To relieve choking in an unresponsive infant, perform the following steps:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Place the infant on a firm, flat surface.</td>
</tr>
<tr>
<td>2</td>
<td>Open the infant’s airway and look for an object in the pharynx. If an object is visible, remove it. Do not perform a blind finger sweep.</td>
</tr>
<tr>
<td>3</td>
<td>Begin CPR with 1 extra step: each time you open the airway, look for the obstructing object in the back of the throat. If you see an object, remove it.</td>
</tr>
<tr>
<td>4</td>
<td>After approximately 5 cycles (about 2 minutes) of CPR, activate the emergency response system.</td>
</tr>
</tbody>
</table>
Compressions to Ventilations:

1) Adult:
   - One Rescuer: 30 compressions to 2 ventilations
   - Two Rescuer: 30 compressions to 2 ventilations

2) Child:
   - One Rescuer: 30 compressions to 2 ventilations
   - Two Rescuer: 15 compressions to 2 ventilations

3) Infant:
   - One Rescuer: 30 compressions to 2 ventilations
   - Two Rescuer: 15 compressions to 2 ventilations

   - The rate for performing chest compressions on a victim of any age is at least 100 compressions per minute.
   - The best way to allow full chest recoil after each chest compression is to take your weight off your hands and allow the chest to come back to its normal position.
   - Head tilt chin lift is the best way to open an airway on an unresponsive victim when you do not suspect cervical spine injury. If cervical spine injury is suspected, use the jaw thrust method. If the jaw thrust method is unsuccessful, use the head tilt chin lift to open the airway.
   - The most effective breathing for a victim is to make sure the chest rises visibly.

Determine lack of normal breathing in an unresponsive victim:

   - In unresponsive victims who have agonal gasps, you must open the airway and administer 2 breaths.
   - When a victim is unresponsive and not breathing and does not have a pulse, you start chest compressions and ventilations.
   - When administering CPR to an infant using the two rescuer method (two thumbs encircling hands technique), you administer cycles of 15 compressions to 2 ventilations with one rescuer giving chest compressions and the other giving ventilations.
   - If you are alone and find an infant who is unresponsive, administer 2 minutes (5 cycles) of CPR before activating the emergency response system.
   - It is important to administer early defibrillation to an adult because the probability of successful defibrillation rapidly diminishes over time.

Common steps to operating an AED:

1) “Power on the AED”
2) Attach the pads – never remove pads from the victim until advanced care arrives
3) Clear the victim – do not touch the victim or you may be “shocked”
4) Allow the AED to analyze the rhythm
5) **If a shock is advised**, deliver the shock
6) After each shock, resume CPR immediately, starting with compressions
7) **If no shock is advised**, continue CPR starting with compressions

**Lone rescuer with an AED:**

1) The lone rescuer should quickly activate the emergency response system, get the AED, return to the victim and begin the steps of CPR.
   - Two exceptions:
     - If the victim is an adult and hypoxic (drowning victim), the rescuer should give 5 cycles (2 min.) of CPR before activating the emergency response system and getting the AED.
     - If the victim is a child and the rescuer did not witness the arrest, the rescuer should give 5 cycles (2 min.) of CPR before activating the emergency response system and getting the AED.

**Choking:**

1) Responsive Victim:
   - Adult/child: abdominal thrusts (i.e. Heimlich maneuver)
   - Infant: 5 back slaps followed by 5 chest thrusts
2) Unresponsive Victim:
   - Adult/Child/Infant: Open the airway, look for the object, if the object is seen, attempt to remove it (no blind finger sweeps), give 2 rescue breaths, begin CPR

- You increase a victim’s chance of survival when you minimize the interruptions in chest compressions
- Use only adult AED pads and system on an adult victim. Never use child AED pads and system on an adult, however, you can use adult AED pads and system on a child ages 1 yr. – 8 yrs. if a child system is unavailable.