

BLS Study Guide *2011*



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Basic Life Support (BLS)

This Study Guide will review the **2010 AHA Guidelines for CPR and ECC for BLS** which includes the activities of the first responder(s) at the scene of a collapsed or choking victim.

2010 Guidelines
changes overview

- Change in CPR sequence from Airway-Breathing-Compressions (A-B-C) to Compressions-Airway-Breathing (C-A-B)
- Continued emphasis on providing high-quality chest compressions
- Chest should be compressed **at least 2 inches** (opposed to 1½"-2")
- Compressions performed at a rate of **at least 100/min** (opposed to **about** 100/min)
- **EMS is activated after** determining the victim is unresponsive and not breathing at all or not breathing normally (gaspings)
- Healthcare providers who do not feel a pulse after 10 seconds should begin chest compressions and use the AED as soon as available and ready for use.
- Compressions should be started as soon as possible and interruptions in chest compressions should be minimized throughout the entire resuscitation process.
- Look, Listen, and Feel is **removed from the CPR sequence** since resuscitation now starts with compressions.
- After 30 compressions are given, the rescuer should open the airway and deliver 2 breaths.
- A manual defibrillator is preferred for infants (<1 yr). If not available **an AED may now be used for infants**.

- **C-ompressions:** push hard (2 inches) and fast (at least 100/min) in the center of the victim's chest
- **A-irway:** tilt the victim's head back and lift the chin to open the airway
- **B-reathing:** give mouth-to-mouth or mouth-to-mask rescue breaths

C-A-B

Rationale

All cardiac arrest victims need chest compressions as soon as possible. In the first few minutes following cardiac arrest, there will be enough oxygen remaining in the victim's lungs and bloodstream. When compressions are started first, the oxygen in the blood will be circulated to the victim's brain and lungs sooner, than if time was taken to deliver breaths before compressions.

ASSESSMENT OF THE ADULT VICTIM

General Considerations

2010 Guidelines

A lone rescuer finds an unresponsive adult (no movement, or response to stimuli) or witnesses an adult who suddenly collapses. **After ensuring the environment is safe, check for response by tapping the victim on the shoulder and shouting: "Are you OK?"** If there is no response and the victim is not breathing or not breathing normally (gasp*)- **Call out for HELP from others or tell others in your location to- CALL 911 and get an AED or call the code team in your facility.**

*** Look-Listen-and Feel is no longer utilized to determine breathing. Checking for response and breathing are done simultaneously.**

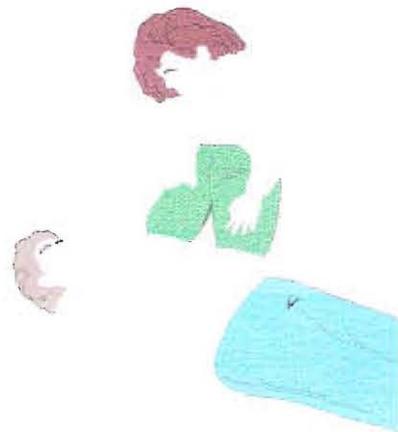


Figure 1. Determine unresponsiveness and breathing, activate the emergency medical services system (EMS), and get an AED as most victims of cardiac arrest will require early defibrillation to be resuscitated. Check pulse for no more than 10 seconds. Begin CPR with compressions.

Preparing for resuscitation

Pulse Check
De-emphasized

C
A
B

- Victim must be supine (on his/her back) and on a firm, flat surface. If a backboard is used, delays in the initiation and interruptions of CPR should be avoided. Air-filled mattresses should be deflated when performing CPR.
- The 2010 AHA Guidelines for CPR and ECC de-emphasize the pulse check as a means to identify cardiac arrest.
- Because delays in chest compressions should be minimized, the healthcare provider should take no longer than 10 seconds to check for a pulse.
- If a pulse is not definitely felt within 10 seconds, the rescuer should deliver 30 chest compressions at a rate of at least 100/min.
- After 30 compressions, use the Head-Tilt-Chin-Lift to open the airway and give 2 breaths (1 second for each breath) watching for visible chest rise.
- Allow the lungs to deflate between ventilations. The victim will exhale by normal relaxation of the chest.

- Failure to ventilate lungs adequately can be caused by inadequate head-tilt and chin-lift or excessive air in the stomach (gastric distention). Gastric distention is caused by rescue breaths delivered too quickly and too forcefully.
- **The routine use of cricoid pressure in adult cardiac arrest is not recommended.**
- **Bag-mask ventilation is NOT recommended for a lone rescuer.** Bag-mask ventilation is most effective when provided by 2 trained and experienced rescuers. One rescuer opens the airway and seals the mask on the face while the other squeezes the bag.
- If neck injury is suspected, be careful to stabilize the neck when positioning the victim's head. When opening the airway, use a simultaneous jaw thrust and cervical spine immobilization technique by a second rescuer (see Figure 2).
- If unable to open the airway with the jaw thrust after several attempts, use the head-tilt chin-lift to open the airway and provide rescue breaths.

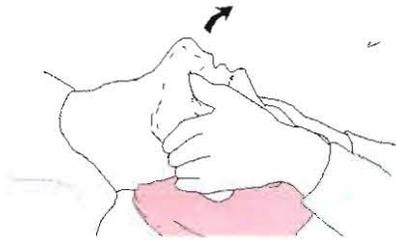


Figure 2. The jaw-thrust maneuver. The airway is opened by lifting the angle of the lower jaw (mandible). The rescuer uses two or three fingers of each hand to lift the corner of the jaw forward while the thumbs are placed on the upper jaw (maxilla) to provide stabilization.

ADULT CPR

- Make sure the scene is safe
- Shake the victim's shoulder and shout to see if they respond
- If no response, and not breathing/not breathing normally, call for help
 - Immediately start CPR beginning with compressions
 - Use an AED as soon as available

C – CIRCULATION

- Palpate carotid pulse for no more than 10 seconds, if a pulse is not definitely felt start chest compressions (see Figure 3).
- **Push HARD and Push FAST**, allowing complete chest recoil (return to neutral/normal position) between compressions.
- **Chest should be depressed at least 2 inches.**
- **Compression to ventilation ratio for ADULT one-rescuer AND two-rescuer CPR is 30:2. Compression rate is at least 100 per minute.**

Initial Pulse Check

Note: Healthcare providers should interrupt chest compressions as infrequently as possible including checking for a return of pulse/spontaneous circulation during resuscitation efforts.

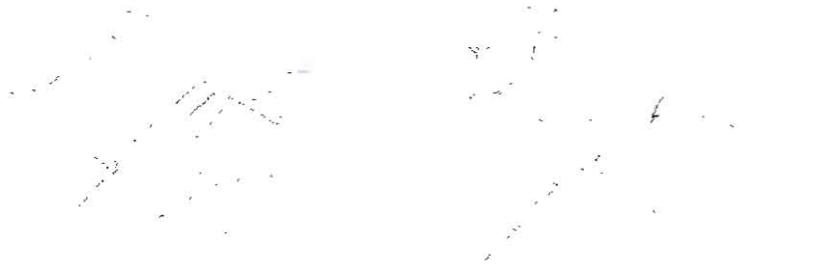


Figure 3. Checking for pulse. Locate the larynx while maintaining the head-tilt position (left). Slide the fingers into the groove between the trachea and muscle at the side of the neck where the carotid pulse can be felt (right).

Proper Hand position for external chest compressions



Figure 4. Remove clothing to locate position on the chest. Place the heel of one hand on the center (middle) of the victim's chest and the other hand on top of the first so that the hands are overlapped and parallel.

Maintaining Adequate Compressions

Continue compression and ventilations for two full minutes (5 cycles of 30:2 CPR). Rescuer fatigue may lead to inadequate compression rates or depth. When 2 or more rescuers are available, it is reasonable to switch chest compressors every two minutes to increase the quality of compressions. Switch rescuers within 10 seconds and immediately resume compressions and ventilations.

Figure 5. Proper position of the rescuer



- Hands placed in the center of the victim's chest with the heel of one hand on the sternum and the other hand overlapped and parallel to the first
- Shoulders directly over the victim's sternum
- Elbows in locked position
- Knees close to the victim's side
- Compress the chest **at least 2 in./5 cm**
- Release/recoil cycle needed to achieve maximum arterial pressure is 50% compression and 50% chest relaxation. Total chest recoil (release or upward movement of the compression) is extremely important to decrease intrathoracic pressure and allow the heart to refill with blood.

BLS for the pregnant victim

When cardiac arrest occurs in a pregnant woman, standard rescue measures should be taken with minimal modification. Circulation= tilt the woman to her left side with her back elevated 15°-30° off the flat surface. A wedge, such as a small pillow, should be placed under the right abdominal flank and hip to displace the uterus to the left side of the abdomen. Another option- have one rescuer kneel on the woman's left side and pull the abdomen/uterus over to the left side to relieve pressure on the vena cava. Airway and breathing are provided with no modifications from standard CPR technique.

Hands-Only CPR

Hands-Only (compression only) CPR

It has been shown that hands-only bystander CPR improves survival. However, only about 20%-30% of adults who have cardiac arrest out-of-hospital receive any CPR from bystanders.

During sudden cardiac arrest with ventricular fibrillation, rescue breathing is not as important as chest compressions because the oxygen level in the blood is adequate for several minutes after cardiac arrest. Other sources of some additional oxygenation include gasping or agonal gasps by the victim and the passive chest recoil during the relaxation phase of chest compressions. The recoil provides for some air exchange in the first few minutes of CPR. When CPR is prolonged, the need for supplementary oxygen with assisted ventilation becomes necessary.

Successful resuscitation from pediatric arrests (other than witnessed collapse) and from asphyxial related cardiac arrests in adults and children include **conventional CPR with rescue breathing**. This includes rescues occurring in and out of hospital environments.

2010 Guidelines

A=Airway

Airway obstruction produced by the tongue and epiglottis is relieved with the **head-tilt** (one hand on the victim's forehead)- **chin-lift** (fingers on the center bony portion of the chin).

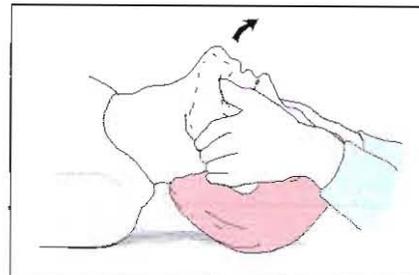


Figure 6. Open the airway. Airway obstruction produced by tongue and epiglottis (top); relieved by head tilt-chin lift (right).



Reminder:

If healthcare providers suspect a neck injury, they should use the jaw-thrust without head extension because maintaining an open airway and providing adequate ventilations is a priority. The head-tilt, chin-lift should be used when the jaw thrust does not open the airway.



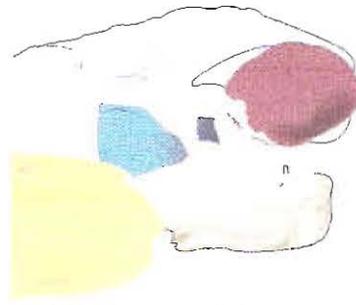
B= Breathing

When respiratory arrest occurs, early intervention may prevent cardiac arrest.

Figure 7- Mouth-to-mouth rescue breathing for adults and children

Give two breaths and observe for rise and fall of the chest. If initial attempt to ventilate victim is unsuccessful, reposition the head and repeat rescue breathing- Improper chin and head positioning is the most common cause of difficulty with ventilation. Remember, the most common cause of airway obstruction in an unresponsive victim is the TONGUE.

Assess need for compressions by checking for carotid pulse. **If pulse is present**, begin rescue breathing for the victim. Give one rescue breath every 5-6 seconds. Pulse may be reassessed approximately every 2 minutes during **rescue breathing** but **spend no more than 10 seconds** to check for pulse.



- ⇒ Create airtight mouth-mouth seal
- ⇒ Take 2 regular (not deep) breaths
- ⇒ If chest doesn't rise, reposition the head and give a second breath
- ⇒ Breaths are given at a rate of 1 every 5-6 seconds or 10-12/min when pulse is present.

Mouth-to-mask/barrier device breathing for adults and children

- Mouth-to-mask/barrier breathing is a reliable form of ventilation. It allows both hands to be used to create a mask seal over the mouth and nose.
- Use the head-tilt-chin-lift maneuver throughout the rescue breathing procedure.
- When using a barrier device the rescuer should not delay chest compressions while setting up the device. Compressions should not be interrupted more than 10 seconds.

Bag-mask ventilation

2010 Guidelines

Bag-mask ventilation is NOT the recommended method of ventilation for a lone rescuer during CPR.

The 2010 Guidelines state that bag-mask ventilation is most effective when provided by 2 trained and experienced rescuers.

One rescuer opens the airway and seals the mask to the face while the other rescuer squeezes the bag. Both watch for adequate chest rise.

Supplementary oxygen (>40% concentration) is used at a flow rate of 10-12 L/min when available.

Cricoid Pressure

2010 Guidelines

Cricoid pressure can prevent gastric inflation and reduce the risk of regurgitation and aspiration during bag-mask ventilation but if not used correctly, it may also impede ventilation.

The 2010 Guidelines state that routine use of cricoid pressure in adult cardiac arrest is **no longer recommended**.

TWO RESCUER CPR

When two or more healthcare workers arrive at the same time

- One rescuer, after determining if the victim is responsive and breathing, tells the second rescuer to activate EMS/911 or call the code team and get the AED if one is available.
- If a third person responds, he/she can be sent to activate EMS/call code team and get the AED while the other two rescuers begin two-rescuer CPR.
- The first rescuer checks the victim's pulse for no longer than 10 seconds
- If no pulse is felt, compressions begin at a rate of at least 100/min
- After 30 compressions, the second rescuer gives two breaths
- CPR continues for 5 cycles (about 2 minutes) of 30:2, then the rescuers switch places. The switch should take no longer than 10 seconds.

2010 Guidelines

Compression rate = at least 100 per minute

Compression depth is 2 inches

Compressions first, then Open the Airway and Give 2 Breaths

After initial pulse check, interruptions for pulse check during CPR should be minimized.

When a second healthcare worker arrives to assist

- The second rescuer activates EMS/code team and gets the AED if not done by the first rescuer.
- On return, finds hand placement for compressions while first rescuer finishes the cycle giving 2 rescue breaths.
- The second rescuer begins 30 chest compressions and the first rescuer delivers 2 breaths for the victim.
- Continue with the ratio of compression to ventilation of 30:2 and the compression rate of at least 100 per minute.
- About every 2 minutes (5 cycles of 30:2) rescuers should change position to avoid fatigue.

The AED is turned on, applied, and activated *if needed*, as soon as it arrives.
NOTE: Compressions should continue while the AED is set up until the AED prompt indicates it is "analyzing" and directing "Do not touch the patient".

TWO RESCUER CPR FOR ADULTS & CHILDREN

Switch procedure for professionals-

Compressor calls for the switch while delivering compressions. Calls out "change/switch next cycle" or change/switch after breaths".

**2-person rescue
for adults is
30:2**

For adults:

- Ventilator delivers two breaths at the pause of the 30th compression.
- Ventilator moves to the chest and finds landmarks for hand placement (middle of the chest) and begins compressions while compressor moves to the head and provides ventilations beginning a new cycle of 30 compressions and 2 ventilations.



Figure 8 Two rescuers CPR

**2-person rescue
for children is
15:2**

For children

- Ventilator delivers two breaths at the pause of the 15th compression.
- Ventilator moves to the chest and finds landmark for hand placement (middle of chest) and begins compressions while the compressor moves to the head and provides ventilations beginning the start of a new cycle of 15 compressions and 2 ventilations

Recovery position

- When an unresponsive victim resumes spontaneous breathing and regains a pulse, the rescuer should place the victim in the recovery position to maintain an open airway and reduce the risk of airway obstruction and aspiration.
- Roll the victim onto the side so that the head, shoulders and torso move *simultaneously without twisting*.
- NOTE: If the victim has sustained trauma or trauma is suspected, the victim should only be moved if an open airway cannot otherwise be maintained. Extending one of the victim's arms above the head and rolling the body to the side so that the victim's head rests on the extended arm while bending both legs may be feasible for victims with known or suspected spinal injury.

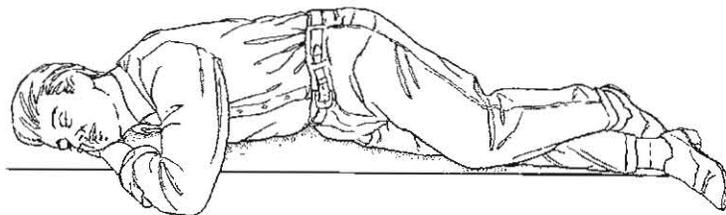


Figure 9. Placing the victim in the recovery position.

AUTOMATED EXTERNAL DEFIBRILLATOR (AED)

Definition

A device that delivers electrical shocks (defibrillation) automatically to the cardiac arrest victim.

Figure 10. Chain of Survival links include:
 1) immediate recognition and activation;
 2) early CPR;
 3) rapid defibrillation;
 4) effective advanced life support and
 5) integrated post-cardiac arrest care.



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Rationale for Early Defibrillation

- Ventricular fibrillation (quivering heart) is the **most frequent** initial rhythm in witnessed sudden cardiac arrest.
- The **most effective treatment** for ventricular fibrillation is electrical shock or defibrillation.
- The chance of successfully changing a quivering heart to one that has a more normal beat decreases rapidly over time.
- Ventricular fibrillation tends to convert (change) to asystole (no heart beat) within a few minutes so rapid defibrillation gives a victim the best chance for survival.

Use of AED

Use an AED with cardiac arrest (no pulse). AED's are approved for use in children 1 up to 8 years.

2010 Guidelines

The AHA recommends that a manual defibrillator is used for infants (<1 yr). If one is not available an AED may be used with a pediatric switch or pads with an attenuator.

AED is not recommended for neonates.

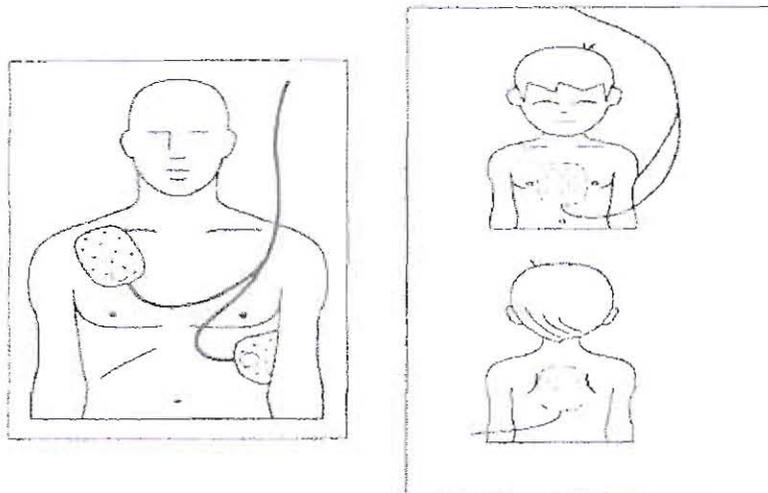
For infants <1 and children 1 up to 8 years, use the pediatric AED pads/system

Children 8 yrs to puberty – use adult pads.

1. Turn on AED as soon as it arrives on the scene.
2. Attach the correct size pads (adult or pediatric) to the victim as directed by the AED. Follow pictures on the pad for correct placement.
 - ADULT (8 yrs and above)**
 - Right sternal border/below right clavicle.
 - Apex of heart/left lower ribs/anterior axillary line.
 - INFANTS (<1 yr) & CHILDREN (1 up to 8 years old)**
 - Centered in the chest between the nipples
 - On the back between the shoulder blades (Phillips Medical)
 - **Note:** some child AED pads for other AED models are placed in the same location as the adult pads.
3. Plug pad connector into the AED
4. AED will automatically analyze the heart rhythm (or you must press button to analyze on some models).
5. If indicated the AED machine will direct the operator to press the shock button and deliver a shock to the victim.

After one shock is delivered, **start CPR immediately, beginning with chest compressions.** Leave the AED on and pads in place while resuming CPR. Every two minutes, the AED voice prompt will return and state “Analyzing, do not touch the patient”. Stop CPR and follow the voice prompts.

Figure 11. Correct AED placement for Adult (8 yrs and above) and infants (<1 yr) children (1 up to 8 yrs.)
Source: Phillips Medical



CHILD CPR (1 yr. UP TO ONSET OF PUBERTY)

Age of Children is 1 year to onset of puberty (about 12-14 years old or breast development in girls and underarm hair in boys);

For Lay Public-Age of Children remains at 1 up to 8 years

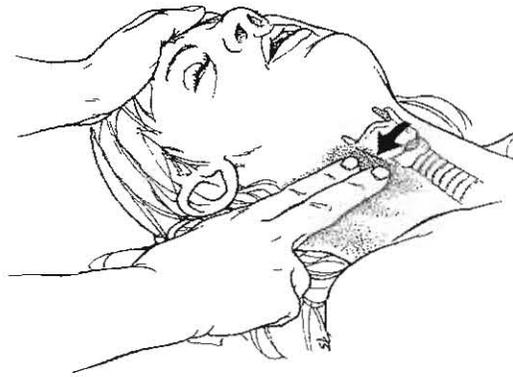
Assessment

Reminder: Look, Listen, and Feel for breathing is no longer recommended

Check for pulse

- Determine unresponsiveness and breathing*- Tap the child’s shoulder and ask “Are you OK?” or look for response/movement/signs of life in *non-verbal children*
 - If no response, call out for help. If you are alone (e.g., at home) with a child or infant victim who is breathless and pulseless (unable to determine within 10 seconds), begin CPR immediately for 2 minutes starting with compressions and then stop and activate EMS (call 911.)
- *Note: gasping, (also called agonal gasp) is not sufficient breathing to sustain life.
- Palpate carotid **or femoral** pulse 5 – 10 seconds. If you aren’t sure you feel a pulse after 10 seconds, start Compressions.
 - If pulse is greater than 60 bpm but no breathing or inadequate breathing, give rescue breaths about 1 every 3-5 seconds or 12-20/min.
 - If no pulse, remove or open clothing from the chest and begin chest compressions.

Figure 12.
Locating and palpating the carotid artery pulse in the child



2010 Guidelines

C = Circulation

- Place the **HEEL OF ONE OR TWO HANDS** at the nipple line (e.g. smaller rescuer may need two hands to compress the chest adequately).
- **Compress chest at least 1/3 the anterior-posterior diameter of the chest which is approximately 1½ inches in most infants and about 2 inches in most children**
- **Single rescuer compression to ventilation ratio is 30:2.**
- **Two-rescuer compression to ventilation ratio is 15:2**

A – Airway

- Use head-tilt chin-lift to open the airway

B – Breathing

Give two breaths, one second each, if needed

- Give 2 breaths, 1 second each
- Watch for rise and fall of the chest.
- The volume of rescue breaths is the amount needed to expand the chest adequately and cause the chest to rise.
- Reposition the head if chest does not rise, attempt to ventilate again.
- Do not delay return to chest compressions for longer than 10 seconds



Figure 13. Rescue breathing in a child. Inspiration (breath) should last 1 second.

INFANT CPR

Assessment

- Determine unresponsiveness by tapping the heel of the infant's foot
 - Look for signs of life such as movement, crying, breathing*.
 - If no response, call out for help and begin CPR starting with compressions.
- * Note: gasping, (also called agonal gasp) is not sufficient breathing to sustain life.

C – Circulation

Palpate brachial **or femoral** pulse no longer than 10 seconds

Check for pulse, if no pulse, or pulse is less than 60 bpm, begin chest compressions

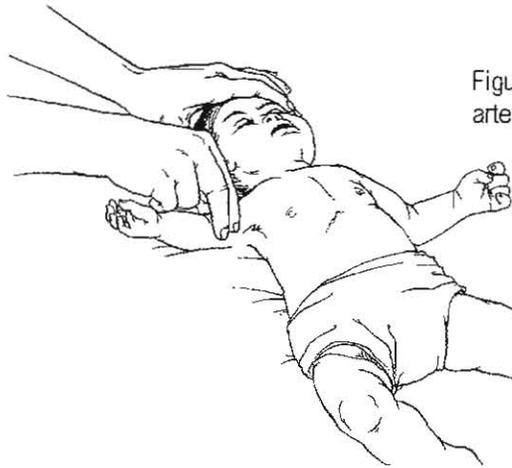
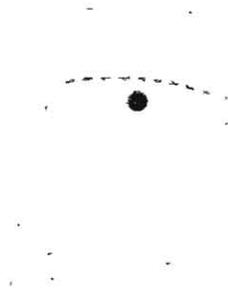


Figure 14. Palpating the brachial artery pulse in an infant.

Remove clothing from chest as needed.

Chest compressions are performed using two fingers placed **just below the nipple line**. Align fingers lengthwise along the sternum rather than widthwise across the sternum.



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Figure 15-16 placement of 2 fingers just below the nipple line

2010 Standard

- Keep other hand on forehead of infant during compressions. This allows rapid coordination of compressions and ventilations.
- **Compress chest at least 1/3 the depth of the chest or 1½ in./4cm** and at a rate of at least 100 beats per minute.
- **Compression to ventilation ratio is 30:2 (2-person ratio-15:2)**

The 2-thumb-encircling hands technique of chest compression is the preferred method for chest compressions in infants performed by healthcare providers when 2 rescuers are available.



Figure 17 two-thumb encircling hands technique for chest compression.

For healthcare providers, 2-rescuer CPR for infants is at a ratio of 15 compressions and 2 breaths.

2010 Guidelines

There are insufficient data for or against the need for a circumferential squeeze of the chest when performing the 2-thumb technique of external chest compression for infants.

When providing chest compressions for infants, the circumferential squeeze can be used.

A –Airway

- After giving 30 compressions, open the airway and deliver 2 breaths
- Keep infant's head in a NEUTRAL or "sniffing" position. Do not hyperextend the infant's neck!



Figure 18 Opening the airway with the head-tilt-chin-lift maneuver.

B –Breathing

2010 Guidelines

- As with children, gasping breaths should be treated as no breathing.
- Make an airtight seal with your mouth around the infant's mouth and nose (see figure 19). If the chest does not rise, reposition the head and ventilate again.
- Distended abdomen in an infant during rescue breathing is most likely caused by *breaths delivered too forcefully or too quickly*.
- Research has shown that room air is superior to oxygen in infants and neonates.
- Data is insufficient to recommend any specific oxygen concentration for ventilation during resuscitation. Once circulation is restored, inspired oxygen should be titrated to prevent the delivery of too much oxygen or hyperoxemia.

Figure 19- Rescue breathing in an infant. The rescuer's mouth covers the infant's nose and mouth, creating a seal



AIRWAY OBSTRUCTION

Causes of airway obstruction (Choking)

Recognition of airway obstruction in adults and children

- The most common cause of airway obstruction in the unconscious person is the tongue.
- Large poorly chewed pieces of food.
- Drinking alcohol and/or talking while eating
- Running/walking/playing while eating
- Foreign object (toy, pieces of food, peanuts, etc.) placed in mouth and/or nose.
- Choking is often witnessed and rescue efforts mostly occur while the choking victim is still awake and responsive.
- Efforts to assist the choking person are very successful and survival rates can exceed 95%.
- If the person is awake, **ask “Are you choking?”**

Foreign Body Airway Obstruction (FBAO) produces signs of mild or severe airway obstruction

Mild Obstruction

- When a mild obstruction exists, the victim should be encouraged to spontaneously cough and breathe. Do not interfere with the person's attempts to expel the foreign body. Let the person cough, but stay with them. Closely monitor the person and activate the EMS system if needed.

Severe obstruction

Rescuers should act/intervene only when signs of severe airway obstruction are present

- There is no air exchange, the victim may turn blue around the mouth and face. The victim is unable to speak, breathe, or has a silent cough and may clutch his/her neck.
- The person may look frightened and when asked if they are choking, will indicate "yes" by nodding their head.

Figure 20. Universal sign of obstructed airway.



ABDOMINAL THRUST

Abdominal thrust or Heimlich maneuver is recommended for relieving foreign body airway obstruction in responsive children and adults. Abdominal thrusts force air from the lungs to create an artificial cough that removes the foreign body from the airway. Each individual thrust should be administered with the intent of relieving the obstruction. Your hands should never be placed on the lower end of the sternum (xiphoid process); they should be below this area, but above the navel and in the middle of the abdominal area.



Figure 21. Abdominal thrusts administered to a responsive victim of foreign-body airway obstruction who is sitting or standing.

Conscious victim

- Stand behind victim with your arms around his/her waist.
- Make a fist with one hand.
- Place thumb side of your fist against victim's abdomen slightly above the navel
- Grasp the fist with your other hand
- Press the fist into the victim's abdomen with quick upward thrust
- For pregnant or obese choking victims, place your fist at mid chest level and deliver chest thrusts. Repeat until the foreign body is expelled or the victim becomes unresponsive.
- **Once the adult victim becomes unresponsive you should carefully lower the person to the ground/floor and send someone to call for help and begin CPR starting with compressions and without a pulse check.**
- **Prior to giving rescue breaths, check the mouth for the object & remove if seen. The routine use of a finger sweep is not recommended.**

2010 Guidelines

Figure 22- Abdominal thrust for a child

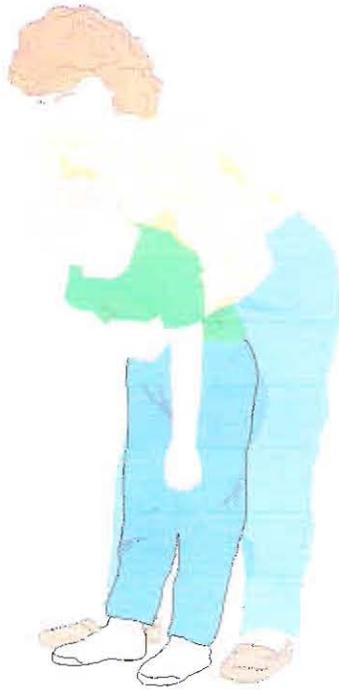


Figure 23- Chest thrusts administered to a pregnant victim of foreign body airway obstruction. Chest thrusts can also be used for obese victims.

**Unwitnessed,
Unresponsive
victim of FBAO**

**Adults and
Children**

2010 Guidelines

- Victim should be placed in supine position face up.
- Establish unresponsiveness and check for breathing.
- If no response or breathing, Call for help/send someone to activate EMS
- Check the pulse for no more than 10 seconds
- Begin chest compressions (30 compressions)
- Open the airway and attempt to deliver a breath. If obstructed, reposition the head and reattempt to ventilate.
- If still obstructed. Check the mouth for a foreign object and remove if seen
- Do not delay chest compressions longer than 10 seconds when attempting to provide rescue breaths
- Continue to provide chest compressions and breaths (30:2)
- Every time the rescuer opens the airway to deliver breaths, the rescuer should look in the mouth for the foreign object and remove if seen.

MANAGEMENT OF AIRWAY OBSTRUCTION IN INFANTS

Responsive

Assess the infant's ability to breathe. Look for signs of obstruction. If the airway is **severely** obstructed, begin steps 1-3 described below.

Step 1. Place the infant over your forearm with the head lower than the trunk while supporting the infant's head with your hand.

Step 2. Deliver 5 back slaps forcefully with the heel of the hand between the infant's shoulder blades.



Figure 24. Position for infant back slaps with head lower than the trunk.

Step 3. After giving the back slaps, "sandwich" the infant between your two arms taking care to support the head and neck and turn the infant over. Keep the head lower than the trunk. Deliver 5 chest thrusts with two fingers just below the nipple line.



Figure 25. Position for infant chest thrusts with head lower than the trunk.

Continue to repeat the steps until the foreign object is out or the infant becomes unresponsive.

Unresponsive

- Once the infant becomes unresponsive, activate EMS and begin CPR.
- Look inside the infant's mouth for the foreign object every time rescue breaths are given.
- Remove the object if you see it. Do not perform blind finger sweeps.

Table 1. BLS Summary Performance Sheet: Cardiopulmonary Resuscitation (CPR)

	CPR	Age Groups		
		Adult (puberty & over)	Child (1 to puberty)	Infant (under 1 yr.)
	Objectives	Actions		
Assessment	Position the victim	Turn on back as a unit, supporting head and neck if necessary		
	Determine responsiveness and check if breathing	Tap or gently shake shoulder and say "Are you OK?". Check for normal breathing	Tap or flick the bottom of the foot. Check for normal breathing	
	Get help- for witnessed collapse, Call First for all aged victims	Call out for help. If alone, Call EMS/code team and get an AED	Call out for help. If alone, do CPR for 2 minutes (one cycle of 30:2) and then call EMS. For sudden collapse, activate EMS/code team first.	
C. Circulation	Assessment: Check pulse for no longer than 10 seconds	Feel for carotid pulse in adult; carotid or femoral pulse in children (5-10 seconds)	Feel for brachial or femoral pulse (5-10 seconds)	
	Begin chest compressions	Place heel of one hand on the center of the chest at mid-nipple line and other hand over the first	Place heel of one hand on the center of the chest at the mid-nipple line. Two hands can also be used in same location.	Place 2 fingers on the sternum one finger width below the nipple line
	Depth of compression	2 inches- allowing chest recoil between each compression	1/3 the ant./post diameter of the chest or about 2 inches in most children	1/3 the ant./post diameter of the chest or 1½ inches in most infants
	Compression rate	At least 100 per minute		
	Compressions to breaths	30:2	30:2 single rescuer, 15:2 for two rescuers	
	Cycles every 2 minutes	5 cycles of 30:2		
	Reassessment	Continue cycles of 30:2 until help/EMS arrives If victim begins to respond (spontaneous breathing or movement) place in the recovery position and remain with the victim until help arrives		
A. Airway	Open the airway	Use the head-tilt chin-lift to open the way	Use head-tilt chin-lift with care to not over extend the neck	
B. Breathing	Assessment: Determine Breathlessness	Look, over the chest and observe for signs of normal breathing or agonal breaths (taking no more than 10 seconds) NOTE: checking for breathing is done at the same time as checking for responsiveness.		
	Give 2 rescue breaths, one second each.	After completing compressions, use the head-tilt, chin-lift to open the airway		
		Seal mouth to mouth	Seal mouth to nose & mouth.	
		Give 2 rescue breaths 1 second per breath. Observe chest rise. Allow lung deflation between breaths.		
Option if the victim has pulse but is not breathing	If no breathing, give rescue breaths	Give 10-12 breaths/minute (approx. 1 breath every 5-6 seconds).	Give 12-20 breaths/min (approx. 1 breath every 3-5 seconds).	

Table 2. BLS Summary Performance Sheet: Foreign Body Airway Obstruction (FBAO)

	FBAO	Ages		
		Adult (puberty & over)	Child (1 to puberty)	Infant (under 1 yr.)
	Objectives	Action		
Choking victim with MILD airway obstruction	Determine extent of airway obstruction	Victim is able to breath, speak or cough forcefully- do not interfere and allow the person to relieve the obstruction on his/her own		
Responsive Victim with a SEVERE airway obstruction	Assessment: Determine airway obstruction	Determine if victim can speak- ask, "Are you choking?" For small child observe breathing and inability to cough or cry.		Observe breathing difficulty, unable to cough or cry.
	Act to relieve obstruction	Perform sub-diaphragmatic abdominal thrusts (Heimlich maneuver.) If pregnant or obese, use chest thrusts		Give 5 back slaps and 5 chest thrusts
	Be persistent	Repeat until obstruction is relieved or victim becomes unresponsive		
Choking victim who becomes unresponsive	Position the victim; call for help	Help to the floor, supporting head and neck, face up, arms by sides. Send someone to call EMS or call out, "Help!" If others come, activate EMS or code team.		
	Begin steps of CPR starting with compressions	At the center of the chest at the nipple line give 30 compressions. Do not stop to do a pulse check		Place 2 fingers on breastbone, one finger width below the nipple line and give 30 compressions
	Breathing	Open the mouth and check for the foreign object/obstruction		
	If object is seen	Remove the object with a grasping motion- do not use a finger sweep		
	If object is not seen	Take two breaths covering the victim's mouth while pinching the nose closed. Reposition the head between breaths if needed		Take two breaths covering mouth and nose- reposition if needed
	Re-check the mouth for the object	Continue to deliver 30 compressions and 2 breaths. Before giving rescue breaths, check the mouth for the foreign object and remove if seen.		
Victim found unresponsive	Assessment: Determine breathing and unresponsiveness	Tap or gently shake shoulder. Shout, "Are you okay?" Check for signs of normal breathing or agonal breaths		Tap bottom of the foot and check for normal breathing.
	Call for help. Position the victim	Turn on back as a unit, supporting head and neck, face up, arms by sides. Call out "Help!" If others come, active EMS.		
	Check pulse	Adult-Feel for carotid; Child- feel for carotid or femoral pulse no more than 10 seconds		Feel for brachial pulse no more than 10 seconds
	Begin CPR	Check for pulse and begin chest compressions, checking mouth before giving rescue breaths		
	Remove the foreign body	Remove the object with a grasping motion if seen- do not use a finger sweep		
		Continue to perform CPR until help arrives		
Defibrillation with an AED	If witnessed collapse use AED as soon as available. Un-witnessed collapse use AED after 5 cycles of CPR	Use adult pads only.	Use pediatric pads (1 up to 8 yrs). May use adult pads if pediatric pads un-available	<1 year of age Recommend using a manual defibrillator. Use pediatric pads when using an AED

Module adapted from American Heart Association Healthcare Provider Student Manual (2006); 2010 American Heart Association Guidelines for CPR and ECC; and Circulation, Journal of the American Heart Association 2010.