

St. David's Healthcare

Basic Life Support (BLS) for Healthcare Provider (HCP)

2015 Study Guide

BLS for HCP includes:

- Adult 1 & 2 Rescuer CPR
- Child 1 & 2 Rescuer CPR
- Infant 1 & 2 Rescuer CPR
- Rescue Breathing/Bag-Mask-Ventilation
- Adult and Child AED
- Adult/Child/Infant Foreign Body Airway Obstruction
- Written Exam and Skills Check-off.

Major Changes/Key Principles:

- ♥ Compression technique is most important aspect:
 - ♥ HARD and FAST
 - ♥ Allow for complete recoil following compression
 - ♥ Never interrupt compressions for longer than 10 seconds—interruption reduces blood pressure and coronary perfusion pressure
 - ♥ Maintain a compression rate of at least 100/minute
- ♥ Sequence for CPR: Check for Responsiveness, then **C**-Compressions; **A**-Airway; **B**-Breathing.
- ♥ Ventilations must be controlled—do not hyperventilate:
 - ♥ Hyperventilation interferes with compressions
 - ♥ Deliver breaths over 1 second to obtain visible chest rise—not too deep!
 - ♥ Count the seconds between breaths to control rate—once every 5 seconds for adult, child and infant is acceptable.
- ♥ AED limited to 1 shock:
 - ♥ Apply AED while still delivering compressions.
 - ♥ Stop compression only when AED says “Analyzing compressions...”
 - ♥ Shock when prompted.
 - ♥ Immediately resume 5 cycles of 30:2 compressions **WITHOUT** a pulse check.
 - ♥ Then assess and check breathing and pulse.
- ♥ Unconscious Foreign Body Airway Obstruction:
 - ♥ Establish unresponsiveness
 - ♥ Activate EMS
 - ♥ Check pulse and if no pulse
 - ♥ Begin compressions at ratio of 30:2
 - ♥ If unable to ventilate, reposition and reattempt no longer than 10 seconds.
 - ♥ Reexamine mouth after each 2-minute round compressions for foreign body.

Major Controllable Risk Factors of Heart Attack and Stroke: the focus is on the factors we can change:

- ♥ Cigarette smoking
- ♥ Hypertension (high blood pressure)
- ♥ High cholesterol level
- ♥ Lack of exercise
- ♥ Obesity
- ♥ Heart Disease
- ♥ Transient ischemic attacks (TIAs)

Early Symptoms of a heart attack—some people may have mild chest symptoms; some people may not have all of these and they may come and go until becoming constant and severe:

- ♥ Nausea
- ♥ Pain that travels down one or both arms
- ♥ Jaw pain
- ♥ Fatigue/weakness
- ♥ Shortness of breath (SOB)
- ♥ Anxiety
- ♥ Chest pressure squeezing or discomfort
- ♥ Back pain
- ♥ Feeling of fullness

STROKE

A **stroke** results from an interruption in the flow of blood to specific areas of the brain OR from damage resulting from bleeding into the brain. CPR providers must be able to recognize the signs & symptoms of stroke, which include:

- ♥ alteration in consciousness
- ♥ severe headache
- ♥ aphasia, facial weakness or asymmetry
- ♥ poor coordination
- ♥ poor balance
- ♥ visual disturbance
- ♥ slurred speech
- ♥ severe dizziness

Early access is critical in the care of patients with stroke because new thrombolytic therapies are available that may minimize consequences of stroke in some patients who can be evaluated and treated within 3 hours of the onset of symptoms.

HEART ATTACK

For suspected **heart attacks**, always call 911 immediately to activate the EMS system. Do not wait for the “classic picture” of a heart attack before calling 911. (Call 911 when away from the hospital, call your hospital's emergency number when inside the hospital.) Instruct the patient to lie down or sit quietly until help arrives. Immediate CPR and defibrillation within 3-5 minutes gives the best chance of survival from sudden cardiac arrest.

In the hospital ... to call a Code, dial your emergency number.

Your emergency number is listed below:

- ♥ St. David's Medical Center – 42222
- ♥ North Austin Medical Center – 2222
- ♥ South Austin Hospital – 7555
- ♥ Round Rock Medical Center – 3
- ♥ Georgetown-- 333
- ♥ Heart Hospital of Austin--7777

Cardiac arrest in children is most often secondary to **severe airway and breathing problems**.

- ♥ Another common cause is accidents
- ♥ Most can be prevented by implementing safety measures

VENTILATION

Correct ventilation is important to provide adequate oxygen and to prevent gastric insufflation:

- ♥ Slow, gentle ventilations help avoid gastric insufflation; rapid and forceful ventilations causes gastric insufflation and probable aspiration.
- ♥ Ventilation volume should be enough to cause the chest to rise and no more.
- ♥ Breaths should be delivered 1 seconds causing the chest to just rise.
- ♥ Avoid hyperventilation as this interferes with compressions.

ADULT—Victim over the age of 12-14 (Puberty)

One Rescuer CPR:

Establish unresponsiveness/no breathing--Activate EMS (outside the hospital) or call a CODE (inside the hospital, use your emergency number). This is done first to ensure faster arrival of EMS and use of defibrillator.

- C** Check carotid pulse and other signs of circulation (breathing, coughing, or movement) for 5 - 10 seconds. No pulse. Begin chest compressions—place two hands between the nipples lower half of the sternum.
- A** After 30 compressions, open airway, using head tilt/chin lift or jaw thrust method. (Use jaw thrust method in cases of suspected neck injury.)
- B** Give 2 slow breaths, 1 second per breath, watching the chest rise with breaths and allow for exhalation between breaths. Do not over-ventilate.

Adult one-rescuer CPR consists of cycles of 30 compressions/2 breaths.

- ♥ Compression should be HARD and FAST; compress between nipples, lower half of the sternum.
- ♥ Rate of compressions is 100-120 compressions per minute at a depth of 2.5 inches.
- ♥ Allow for full recoil after each compression.
- ♥ Perform 5 cycles of 30 compression and 2 breaths—should take approximately 2 minutes.

Two Rescuer Adult CPR:

First Rescuer:

Establish unresponsiveness/no breathing--Activate EMS (outside the hospital) or call a CODE (inside the hospital, use your emergency number). This is done first to ensure faster arrival of EMS and use of defibrillator.

- C** Check carotid pulse and other signs of circulation (breathing, coughing, or movement) for 5 - 10 seconds. No pulse. Begin chest compressions—place two hands between the nipples lower half of the sternum.

Second rescuer

- A** After 30 compressions, open airway, using head tilt/chin lift or jaw thrust method. (Use jaw thrust method in cases of suspected neck injury.)
- B** Give 2 slow breaths, 1 second per breath, watching the chest rise with breaths and allow for exhalation between breaths. Do not over-ventilate. Gives 2 breaths every 30 compressions. The rescuer delivering breaths can check adequacy of chest compressions by feeling for arterial “pulse” from each chest

compression.

Rescuers switch positions every 2 minutes or 5 cycles to avoid fatigue

Adult Bag-Mask Ventilation for Rescue Breathing

Establish unresponsiveness/no breathing--Activate EMS (outside the hospital) or call a CODE (inside the hospital, use your emergency number). This is done first to ensure faster arrival of EMS and use of defibrillator.

- C** Check carotid pulse and other signs of circulation (breathing, coughing, or movement) for 5 - 10 seconds. If patient has a pulse, then,
- A** Open airway, using head tilt/chin lift or jaw thrust method. (Use jaw thrust method in cases of suspected neck injury.)
- B** Give **one breath every 5 seconds, or about 10-12 breaths per minute. Count seconds between breaths to control ventilation rate.** 1 second per breath, watching the chest rise with breaths and allow for exhalation between breaths. Do not over-ventilate. Continue rescue breathing as needed.

Adult Foreign Body Airway Obstruction (Choking)

Conscious

- ♥ Ask: "Are you choking?" If yes, ask "Can you speak?" If no, tell the victim you are going to help.
- ♥ Person displays symptoms of poor or ineffective air exchange.
- ♥ Give abdominal thrusts - sharp inward and upward thrusts against the diaphragm between the xiphoid process and umbilicus. This can be done with the victim standing, sitting or lying down.
- ♥ Use **chest thrusts** for victim who is pregnant or obese.
- ♥ Continue thrusts until airway cleared or person becomes unconscious.

Choking Victim Becomes Unconscious or Found Unconscious

Establish unresponsiveness/no breathing--Activate EMS (outside the hospital) or call a CODE (inside the hospital, use your emergency number). This is done first to ensure faster arrival of EMS and use of defibrillator.

- C** Check carotid pulse and other signs of circulation (breathing, coughing, or movement) for 5 - 10 seconds. No pulse. Begin chest compressions—place two hands between the nipples, lower half of the sternum.
- A** After 30 compressions, open airway, using head tilt/chin lift or jaw thrust method. (Use jaw thrust method in cases of suspected neck injury.)
- B** Check airway for possible foreign body and give 2 slow breaths, 1 second per breath, watching the chest rise with breaths and allow for exhalation between breaths. Do not over-ventilate.
If unable to ventilate—probable inadequate airway - reposition head - reattempt to ventilate.
Unable to ventilate—probable obstruction.
Continue compressions/ventilation 30:2--Check the mouth after each round of compressions for foreign object prior to ventilations.

Adult CPR and AED:

Establish unresponsiveness/no breathing--Activate EMS (outside the hospital) or call a CODE (inside the hospital, use your emergency number). This is done first to ensure faster arrival of EMS and use of defibrillator.

- C** Check carotid pulse and other signs of circulation (breathing, coughing, or movement) for 5 - 10 seconds. No pulse. Begin chest compressions—place two hands between the nipples lower half of the sternum.
- A** After 30 compressions, open airway, using head tilt/chin lift or jaw thrust method. (Use jaw thrust method in cases of suspected neck injury.)
- B** Give 2 slow breaths, 1 second per breath, watching the chest rise with breaths and allow for exhalation between breaths. Do not over-ventilate.

Using the AED

- ♥ If more than one rescuer, continue compressions, while preparing to use AED.
- ♥ Before using the AED: dry the patient, remove from standing water, remove medication patches, avoid implanted pacemakers, avoid jewelry.
- ♥ Place the AED next to the victim. POWER ON the AED and follow the prompts.
- ♥ Attach electrode pads in the proper position.

- ♥ When AED indicates "Analyzing", stop compressions and clear the victim (do not touch the patient) while AED is analyzing.
- ♥ If AED advises shock, clear the victim and press the SHOCK button when advised.
- ♥ Immediately perform 2 minutes of compressions 100-120/min, ratio of 30:2.

- ♥ Reassess pulse and breathing and re-shock as advised.

CHILD **(1 – Puberty; ~ 12 to 14 years of age)**

One Rescuer Child CPR

Establish unresponsiveness/no breathing--Activate EMS (outside the hospital) or call a CODE (inside the hospital, use your emergency number). This is done first to ensure faster arrival of EMS and use of defibrillator.

Witnessed vs Un-witnessed Child Arrest:

Witnessed: Activate EMS and Use AED immediately

Un-witnessed: Perform 2 minutes of CPR, **then** activate EMS and use AED

- C** Check carotid pulse and other signs of circulation (breathing, coughing, or movement) for 5 - 10 seconds. No pulse. Begin chest compressions—place two hands between the nipples lower half of the sternum.
- A** After 30 compressions, open airway, using head tilt/chin lift or jaw thrust method. (Use jaw thrust method in cases of suspected neck injury.)
- B** Give 2 slow breaths, 1 second per breath, watching the chest rise with breaths and allow for exhalation between breaths. Do not over-ventilate.

Child one-rescuer CPR consists of cycles of 30 compressions/2 breaths.

- ♥ Compression should be HARD and FAST; compress between nipples, lower half of the sternum.
- ♥ Rate of compressions is 100-120 compressions per minute at depth of at least 1/2 to 1/3 the depth of the chest (~2.4 inches).
- ♥ Allow for full recoil after each compression.
- ♥ Perform 5 cycles of 30 compression and 2 breaths—should take approximately 2 minutes.

Two Rescuer Child CPR:

First Rescuer:

Establish unresponsiveness/no breathing--Activate EMS (outside the hospital) or call a CODE (inside the hospital, use your emergency number). This is done first to ensure faster arrival of EMS and use of defibrillator.

- C** Check carotid pulse and other signs of circulation (breathing, coughing, or movement) for 5 - 10 seconds. No pulse. Begin chest compressions—place one or two hands between the nipples lower half of the sternum.

Second rescuer

- A** After 15 compressions, open airway, using head tilt/chin lift or jaw thrust method. (Use jaw thrust method in cases of suspected neck injury.)
- B** Give 2 slow breaths, 1 second per breath, watching the chest rise with breaths and allow for exhalation between breaths. Do not over-ventilate. Gives 2 breaths every 15 compressions. The rescuer delivering breaths can check adequacy of chest compressions by feeling for arterial “pulse” from each chest compression.

Rescuers switch positions every 2 minutes or 10 cycles

Child Bag-Mask Ventilation for Rescue Breathing

Establish unresponsiveness/no breathing--Activate EMS (outside the hospital) or call a CODE (inside the hospital, use your emergency number). This is done first to ensure faster arrival of EMS and use of defibrillator.

Witnessed vs Un-witnessed Child Arrest:

Witnessed: Activate EMS and Use AED immediately

Un-witnessed: Perform 2 minutes of CPR, **then** activate EMS and use AED

- C** Check carotid pulse and other signs of circulation (breathing, coughing, or movement) for 5 - 10 seconds. If patient has a pulse, then.
- A** Open airway, using head tilt/chin lift or jaw thrust method. (Use jaw thrust method in cases of suspected neck injury.)
- B** Give **one breath every 3-5 seconds, or about 12-20 breaths per minute. Count seconds between breaths to control ventilation rate.** 1 second per breath, watching the chest rise with breaths and allow for exhalation between breaths. Do not over-ventilate. Continue rescue breathing as needed.

Child Foreign Body Airway Obstruction (Choking)

Conscious

- ♥ Ask: “Are you choking?” If yes, ask “Can you speak?” If no, tell the victim you are going to help.

- ♥ Person displays symptoms of poor or ineffective air exchange.
- ♥ Give abdominal thrusts - sharp inward and upward thrusts against the diaphragm between the xiphoid process and umbilicus. This can be done with the victim standing, sitting or lying down.
- ♥ Use **chest thrusts** for victim who is pregnant or obese.
- ♥ Continue thrusts until airway cleared or person becomes unconscious.

Choking Victim Becomes Unconscious or Found Unconscious

Establish unresponsiveness/no breathing--Activate EMS (outside the hospital) or call a CODE (inside the hospital, use your emergency number). This is done first to ensure faster arrival of EMS and use of defibrillator.

- C** Check carotid pulse and other signs of circulation (breathing, coughing, or movement) for 5 - 10 seconds. No pulse. Begin chest compressions—place one or two hands between the nipples lower half of the sternum.
- A** After 30 compressions, open airway, using head tilt/chin lift or jaw thrust method. (Use jaw thrust method in cases of suspected neck injury.)
- B** Check airway for foreign object and give 2 slow breaths, 1 second per breath, watching the chest rise with breaths and allow for exhalation between breaths. Do not over-ventilate. If unable to ventilate—probable inadequate airway--reposition head - reattempt to ventilate. Unable to ventilate—probable obstruction. Continue compressions/ventilation 30:2--Check the mouth after each round of compressions for foreign object prior to ventilations.

AED use in the Child Victim: (1 – puberty or 12-14 years of age)

AEDs will include both Adult electrodes and Pediatric electrodes. Use pediatric electrodes whenever possible. Pediatric electrode pads will be smaller, contain a voltage regulator on the leads that prevents the child from receiving the same amount of electrical current as the adult. Some models have a “teddy bear” plug at the end of the cable that plugs into the AED.

Pad placement depends on the size of the child:

- ♥ Pad should be placed in the same position as with an adult—under the right clavicle to the right of the sternum and on the left chest below the nipple. (see diagram below)
- ♥ UNLESS the child is so small that the pads are within 1 inch of each other in which case place the pads on the anterior chest over the sternum and on the posterior chest over the spine.
- ♥ If pediatric electrodes are unavailable, use the adult pads as above.

The AED sequence with the child is the same as with the adult

Witnessed vs Un-witnessed Child Arrest:

Witnessed: Activate EMS and Use AED immediately

Un-witnessed: Perform 2 minutes of CPR, **then** activate EMS and use AED

INFANT (0-1 year of age)

One Rescuer Infant CPR

Establish unresponsiveness/no breathing--Activate EMS (outside the hospital) or call a CODE (inside the hospital, use your emergency number). This is done first to ensure faster arrival of EMS and use of defibrillator.

Witnessed vs Un-witnessed Child Arrest:

Witnessed: Activate EMS and Use AED immediately

Un-witnessed: Perform 2 minutes of CPR, **then** activate EMS and use AED

- C** Check brachial pulse and other signs of circulation (breathing, coughing, or movement) for 5-10 seconds. No pulse or pulse less than 60/minute, begin chest compressions—place two fingers just below the nipples lower half of the sternum.
- A** After 30 compressions, open airway, using head tilt/chin lift or jaw thrust method. (Use jaw thrust method in cases of suspected neck injury.)
- B** Give 2 slow breaths, 1 second per breath, watching the chest rise with breaths and allow for exhalation between breaths. Do not over-ventilate.

Infant one-rescuer CPR consists of cycles of 30 compressions/2 breaths.

- ♥ Compression should be HARD and FAST; compress just below nipples, lower half of the sternum.
- ♥ Rate of compressions is 100-120 compressions per minute at depth of at least 1/2 to 1/3 the depth of the chest (~1 ½ inches).

- ♥ Allow for full recoil after each compression.
- ♥ Perform 5 cycles of 30 compression and 2 breaths—should take approximately 2 minutes.

Two Rescuer Infant CPR:

First Rescuer:

Establish unresponsiveness/no breathing--Activate EMS (outside the hospital) or call a CODE (inside the hospital, use your emergency number). This is done first to ensure faster arrival of EMS and use of defibrillator.

- C** Check brachial pulse and other signs of circulation (breathing, coughing, or movement) for 5 - 10 seconds.

No pulse. Begin chest compressions using **two thumbs/encircling hands technique** just below the nipples lower half of the sternum.

Second rescuer

- A** After 15 compressions, open airway, using head tilt/chin lift or jaw thrust method. (Use jaw thrust method in cases of suspected neck injury.)

- B** Give 2 slow breaths, 1 second per breath, watching the chest rise with breaths and allow for exhalation between breaths. Do not over-ventilate. Gives 2 breaths every 15 compressions. The rescuer delivering breaths can check adequacy of chest compressions by feeling for arterial "pulse" from each chest compression.

Rescuers switch positions every 2 minutes or 10 cycles

Infant two-rescuer CPR consists of cycles of 15 compressions/2 breaths.

Rescue Breathing

Establish unresponsiveness/no breathing--Activate EMS (outside the hospital) or call a CODE (inside the hospital, use your emergency number). This is done first to ensure faster arrival of EMS and use of defibrillator.

Witnessed vs Un-witnessed Child Arrest:

Witnessed: Activate EMS and Use AED immediately

Un-witnessed: Perform 2 minutes of CPR, **then** activate EMS and use AED

- C** Check brachial pulse and other signs of circulation (breathing, coughing, or movement) for 5-10 seconds. If patient has a pulse, then,
- A** Open airway, using head tilt/chin lift or jaw thrust method. (Use jaw thrust method in cases of suspected neck injury.)
- B** Give **one breath every 3-5 seconds, or about 12-20 breaths per minute. Count seconds between breaths to control ventilation rate.** 1 second per breath, watching the chest rise with breaths and allow for exhalation between breaths. Do not over-ventilate. Continue rescue breathing.

Infant Foreign Body Airway Obstruction (Choking)

Conscious

Confirm absent or ineffective air exchange (ineffective cough, no strong cry).

Give 5 back blows, with head lower than body, infant face down.

Turn infant face up.

Give 5 chest thrusts using same finger position as for CPR.

Repeat steps until obstruction relieved or infant becomes unconscious.

Becomes Unconscious or Found Unconscious

Establish unresponsiveness/no breathing--Activate EMS (outside the hospital) or call a CODE (inside the hospital, use your emergency number). This is done first to ensure faster arrival of EMS and use of defibrillator.

- C** Check carotid pulse and other signs of circulation (breathing, coughing, or movement) for 5 - 10 seconds. No pulse. Begin chest compressions—using **two thumbs/encircling hands technique** just below the nipples, lower half of the sternum.
- A** After 30 compressions, open airway, using head tilt/chin lift or jaw thrust method. (Use jaw thrust method in cases of suspected neck injury.)
- B** Check airway for foreign object and give 2 slow breaths, 1 second per breath, watching the chest rise with breaths and allow for exhalation between breaths. Do not over-ventilate. If unable to ventilate—probable inadequate airway. Reposition head - reattempt to ventilate. Unable to ventilate—probable obstruction. Continue compressions/ventilation 30:2 (15:2 with 2 rescuers)--Check the mouth after each round of compressions for foreign object prior to ventilations.

Special Considerations:

Jaw Thrust

If you suspect a cervical spine injury, open the airway using a jaw thrust without head extension.

Perform the jaw thrust by:

- ♥ Place one hand on each side of the victim's head, resting your elbows on the surface on which the victim is lying or, alternatively, place your thumbs on the victim's cheekbones.
- ♥ Place your fingers under the angles of the victim's lower jaw and lift with both hands, displacing the jaw forward.
- ♥ If the lips close, retract the lower lip with your thumb.
- ♥ Attempt ventilations.

Because maintaining a patent airway and providing adequate ventilation is a priority in CPR, use a head tilt-chin lift maneuver if the jaw thrust does not open the airway.

Agonal Gasps

Agonal gasps may happen in the first minutes after sudden cardiac arrest. Gasps are not adequate breathing and you must provide rescue breathing and, if indicated, compressions.

Recovery Position

Use the recovery position to manage unresponsive victims who have adequate breathing. When an unresponsive victim is breathing spontaneously, the victim's tongue, mucus, or vomitus may block the airway. By placing the victim on his/her side, fluid can drain easily from the mouth to avoid these problems. You must still closely monitor the victim's pulse and breathing in the recovery position.

The recovery position is not recommended for infants and small children as it may block the airway if the head is not adequately supported.

Place the victim in the recovery position using the following steps:

- ♥ Roll the victim to his/her side.
- ♥ Position the victim to maintain an open airway.
- ♥ Check the victim's breathing often (look, listen and feel).
- ♥ If breathing stops, get the AED, roll the victim to his/her back and begin the C-A-B sequence of CPR.