

HEALTHCARE PROVIDER STUDY GUIDE FOR CPR

1) MAJOR UNCONTROLLABLE RISK FACTORS OF HEART ATTACK & STROKE

- Heredity
- Gender (Male)
- Age (African - American)
- Race

2) MAJOR CONTROLLABLE RISK FACTORS OF HEART ATTACKS & STROKE

- Cigarette Smoking
- High Blood Pressure
- High Blood Cholesterol
- Lack of Exercise
- Obesity
- Heart Disease
- Transient Ischemic Attacks (TIAs)

Other Risk Factors Include:

- Diabetes
- Stress

3) MAJOR SIGNS OF A HEART ATTACK

- Chest discomfort - most common sign, more intense and lasts longer, is not relieved (or is only partially relieved) by rest or nitroglycerin
- Other signs - sweating, nausea, SOB, feeling of weakness
- The elderly, diabetics and women are more likely to present with unusual, a typical angina without classic symptoms or with only vague, nonspecific complaints

4) MAJOR SIGNS OF A STROKE

- Facial paralysis
- Difficulty speaking
- Alteration in consciousness (confusion, stupor, or coma)
- Sudden weakness or numbness of face, arm or leg on one side of the body
- Slurred or incoherent speech
- Unexplained dizziness, unsteadiness, sudden falls
- Dimness or loss of vision, particularly in one eye

5) RISK FACTORS SPECIFIC TO STROKE

- TIAs
- Heart Disease
- High Red Blood Cell Count

6) CHAIN OF SURVIVAL (ADULTS)

- 1st Link - Immediate recognition of cardiac arrest and activation (call 911)
- 2nd Link - Early CPR with an emphasis on chest compressions
- 3rd Link - Rapid Defibrillation
- 4th Link - Effective ACLS
- 5th Link - Integrated Post-cardiac arrest care

*****Good quality CPR improves a victim's chances of survival*****

The Critical Concepts for Quality CPR include:

The healthcare provider should briefly check for "Unresponsiveness" and "no breathing or no normal breathing"(ie, only gasping) then "Activate emergency response system and get AED/Defibrillator.

*** No longer - Look, listen and feel for breathing***

1. 2. Rescuers should initiate chest compressions before giving rescue breaths(C_A_B rather than A_B_C). Beginning CPR with 30 compressions rather than 2 ventilations leads to a shorter delay to first compression.

Check pulse for no more than 10 seconds

2. "PUSH HARD PUSH FAST" Compress at a rate of "at least 100" compressions per minute.
 - a. Adults - at least 2 inches in depth.
 - b. Children - at least 1/3 of the anterior-posterior diameter of chest (2 inches)
 - c. Infants - at least 1/3 of the anterior-posterior diameter of chest (1/2 inches)
3. Compressions of adequate rate and depth, allowing full Chest recoil after each compression
4. Minimize interruptions in chest compressions; try to keep interruptions to less than 10 seconds
5. Avoid hyperventilation when giving breaths.
6. Continue emphasis to reduce the time between the last compression and shock delivery and the time between shock delivery and the resumption of compressions immediately after shock delivery.
7. There's an increased focus on using a team approach during CPR.

EX:

 - a. One rescuer activates emergency response system
 - b. Second rescuer begins chest compressions
 - c. Third rescuer either providing ventilations or retrieving the bag-mask for rescue breathing
 - d. Forth rescuer retrieving and setting up a defibrillator

7) RESCUE BREATHING WITH A PULSE IS GIVEN ONCE EVERY:

- a. ADULT- every 5 to 6 seconds (about 10 - 12 times per minute 1 second/breath)
- b. CHILD- every 3 to 5 seconds (about 20 times per minute)
- c. INFANT- every 3 to 5 seconds (about 20 times per minute)

8) RATIO OF COMPRESSIONS TO VENTILATIONS:

ADULT- 1 Rescuer	30:2
2 Rescuers	30:2
CHILD- 1 Rescuer	30:2
2 Rescuers	15:2
INFANT- 1 Rescuer	30:2
2 Rescuers	15:2

9) RATE OF COMPRESSIONS:

ADULT- at least 100 times per minute
CHILD- at least 100 times per minute
INFANT- at least 100 times per minute

10) DEPTH OF COMPRESSIONS:

- a. ADULT- at least 2" (hand placed on top of hand in center of breastbone between nipples)
- b. CHILD- 1/3 the depth of chest - 2 inches (heel of one hand, other hand on top or 1 hand for small victims in center of breastbone between nipples)
- c. INFANT- 1/3 the depth of infant's chest - 1 & 1/2 inches (2 fingers) or (2 thumb-encircling hands for 2-rescuer CPR) just below nipple line on breastbone

11) AED (Automated External Defibrillators)

The most frequent initial rhythm in witnessed sudden cardiac arrest is Ventricular Fibrillation. The most effective treatment for VF is defibrillation.

For every minute that passes between collapse and defibrillation, survival rates from witnessed VF Sudden Cardiac Arrest decrease 7% to 10% if no CPR is provided.

When bystander CPR is provided, the decrease in survival rates is more gradual and averages 3% to 4% per minutes from collapse to defibrillation.

CPR can double or triple survival from witnessed Sudden Cardiac Arrest at most intervals to defibrillation.

In-hospital use of AEDs - AEDs may be considered for the hospital setting as a way to facilitate early defibrillation (a goal of shock delivery less than or equal to "three minutes" from collapse), especially in areas where staff have no rhythm recognition skills or defibrillators are used infrequently.

PAD (Public Access Defibrillation) legislation has made it available to place AEDs in airports, airplanes, casinos, high-rise office buildings, recreational facilities, golf courses, and Malls operated by trained lay rescuers.

** AEDs should only be used when patients have the following 3 clinical findings:

1. No response
2. No breathing or normal breathing (ie, only gasping)
3. No pulse

For children from 1 - to 8 years of age - an AED with a Pediatric Dose-attenuator system should be used if available. If an AED with a dose-attenuator is not available, a standard AED may be used.

For infants (< 1 year of age) - a manual defibrillator is preferred. If a manual defibrillator is not available, an AED with a pediatric dose-attenuator is desirable.

If neither is available, an AED without a dose-attenuator may be used.

Lone Rescuer with an AED:

- a. In some situations one rescuer with immediate access to an AED may respond to a cardiac arrest. He/she should quickly activate EMS and get the AED. The rescuer should then return to the victim and begin the steps of CPR. The AED should be used only if the victim does not respond, not breathing or normal breathing, and has no pulse.

There are 2 exceptions to this rule:

1. If the victim is an adult and is a likely victim of an asphyxial arrest (e.g., drowning), the rescuer should give 5 cycles of CPR (about 2 minutes) before activating the emergency response system and getting the AED.
2. If the victim is a child and the rescuer did not witness the arrest, the rescuer should give 5 cycles of CPR (about 2 minutes) before activating the emergency response system

Special Situations Requiring Action Before Using AN AED or During Its Operation:

1. If victim is standing in or near water or water covering the victim's chest -water is a good conductor of electricity, so remove and dry victim.
2. If Victim has an implanted pacemaker, defibrillator or Port - place the AED electrode pad at least 1 inch to the side of the implanted device.
3. If Victim has a Transdermal Medication Patch - may cause small burns - or may block the transfer of energy from electrode to pad - remove and wipe the area clean before attaching electrode pad.
4. If victim (teen or adult) has a hairy chest - If pads stick to hair instead of skin, press down firmly on each pad, if AED continues to

prompt "check pads" or "check electrodes" quickly pull off pads or shave the area with razor and put on new set of pads.

Universal Steps for AED Operation:

1. CHECK FOR RESPONSIVENESS AND BREATHING: if the victim does not respond and is not breathing or normally breathing (i.e., only gasping) * activate emergency response (911) and get the AED
2. CHECK FOR PULSE: if pulse is not definitely felt within 10 seconds (for all ages) * Perform chest compressions and prepare to attach the AED: The first rescuer starts chest compressions while the second rescuer prepares to use the AED
3. POWER ON THE AED
 - a. open the carrying case or top of the AED
 - b. turn the power on
4. ATTACH electrode pads to victim's chest
 - a. Choose correct pads (adult vs. child/infant) for size/age of victim. Use pediatric 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.
 - b. Peel backing away from electrode pads.
 - c. Quickly wipe the victim's chest if covered with water or sweat.
 - d. attach pads to victim's bare chest
 1. Place one electrode pad on upper-right side of bare chest to the right of breastbone, directly below the collarbone
 2. Place the other pad to the left of the nipple, a few inches below the left arm pit
 3. attach the AED connecting cables to the AED box
5. "CLEAR" the patient and ANALYZE the rhythm
 - a. Press the ANALYZE button to start rhythm analysis
 - b. Always "CLEAR" the victim during analysis. Be sure that no one is touching the victim, not even the person in charge of rescue breathing
 - c. The AED then tells you if a shock is needed.
6. IF THE AED ADVISES A SHOCK, IT WILL TELL YOU TO BE SURE TO CLEAR THE VICTIM
 - a. clear the victim before delivering the shock: be sure no one is touching the victim
 - b. Loudly state a "clear the patient" message such as "I'm clear, you're clear, everybody clear" or simply "Clear."
7. Perform a visual check to ensure that no one is in contact with the victim.
8. PRESS THE "SHOCK" BUTTON - to deliver the shock when - and only when - the AED signals a shock is indicated and no one is touching the victim
 - a. As soon as the AED gives the shock, begin CPR starting with CHEST COMPRESSIONS.
9. Do not recheck to see if there is a pulse.
10. After 2 MINUTES OF CPR, the AED will prompt you to repeat steps 7 and 8
11. Never remove electrode pads or disconnect patient from AED until EMS arrives.

12. Some AEDs may not be reprogrammed, if that's the case they may do up to 3 stacked shocks, just do what the AED says.

USING AN AED ON A CHILD:

* Most children with cardiac arrest have asphyxial rather than a VF arrest, therefore 2 minutes of CPR are recommended before the lone rescuer activates the emergency response system and gets an AED if one is nearby. The lone rescuer should then return to the victim as soon as possible and use the AED (if available) or resume CPR starting with chest compressions.

* If there are 2 rescuers, one should start CPR immediately and the other should activate the emergency response system and obtain an AED, if one is available.

* For any in-hospital cardiac arrest of a child or for any sudden collapse of a child out-of-hospital, use an AED as soon as it is available.

* For attempted defibrillation of children 1 to 8 years of age with an AED, the rescuer should use a pediatric dose-attenuator system if one is available. If the rescuer provides CPR to a child in cardiac arrest and does not have an AED with a pediatric dose-attenuator system, the rescuer should use a standard AED.

* If you are using an AED for a child 1 to 8 years of age and the AED does not have child pads (as long as the pads do not touch), you may use the adult pads and deliver the adult dose. Pads may have to be placed anterior and posterior.

USING AN AED ON AN INFANTS(Less than 1 year of age):

* Most infants with cardiac arrest have asphyxial rather than a VF arrest, therefore 2 minutes of CPR are recommended before the lone rescuer activates the emergency response system and gets an AED if one is nearby. The lone rescuer should return to the victim as soon as possible and use the AED (if available) or resume CPR starting with chest compressions.

* If there are 2 rescuers, one should start CPR immediately and the other should activate the emergency response system and obtain an AED, if one is available.

* For any in-hospital cardiac arrest of an infant or for any sudden collapse of an infant out-of-hospital, use an AED as soon as it is available.

* For attempted defibrillation of infants < than 1 year of age, a manual defibrillator is preferred when a shockable rhythm is identified by a trained healthcare provider. If a manual defibrillator is not available, an AED equipped with a pediatric dose-attenuator is preferred. If neither is available, an AED without a dose-attenuator may be used.

12) The first thing to do for a collapsed victim is to determine unresponsiveness along with no breathing or no normal breathing (i.e., only gasping) in the adult. In the pediatric victim determine unresponsiveness with no breathing (or only gasping).

13) After calling emergency response system, getting an AED, checking pulse and providing chest compressions, when opening the airway do the "Head Tilt - Chin Lift". If you suspect a cervical spine injury, open the airway using a jaw thrust without head extension. Because maintaining a patent airway and providing adequate ventilation in CPR, you should use a head tilt - chin lift maneuver if the jaw thrust does not open the airway.

- i. Some victims will make weak, inadequate attempts to breathe. In addition, reflex gasping respiratory efforts (agonal respirations) may occur early in the course of primary cardiac arrest. Both absent and no normal(gasping) respirations require rapid intervention with rescue breathing.

14) Breaths given too rapidly or with too much force will result in gastric distention.

a. To prevent gastric inflation:

- a. Take 1 second to deliver each breath
- b. Deliver enough air to make the victim's chest rise

15) Commonly, cardiac arrest in children is a result of a severe airway and breathing problem. (i.e. pneumonia, laryngeal swelling from an allergic reaction, etc).

17) On the unresponsive adult victim, the single most important goal of "call first"

(911) is fast arrival of EMS with the defibrillator.

18) CPR STEPS:

A. ADULT ONE-RESCUER CPR

1. Establish Unresponsiveness- "Are you okay?"
 - a. Tap or gently shake along with recognition of no breathing or no normal
 - b. breathing (i.e., only gasping)
 - c. If you are alone, activate EMS and get an AED if available.
2. Check Carotid Pulse (within 10 seconds).
3. If no pulse, give cycles of 30 chest compressions and 2 breaths
 - a. (push hard and fast at least 100 compressions/minute and release completely) 30 compressions should be accomplished in approximately 18 seconds.
 - b. Put the heel of one hand on the center of the victim's bare chest between the nipples with the heel of the other hand on top of the first hand.
 - c. Press down at least 2 " using 2 hands. At the end of each compression, make sure you allow the chest to recoil or re-expand completely. (Full chest recoil allows more blood to refill the heart between chest compressions.
 - d. Minimize interruptions in chest compressions by limiting interruptions to < than10 seconds.

4. After 5 cycles of 30:2 (about 2 minutes)
 - e. Check pulse.
 1. ** If no pulse, continue 30:2 cycle beginning with chest compressions.*

5. Attach and use AED as soon as available.

- i. If victim is breathing or resumes effective breathing, place in recovery position. Victim is placed on their side, head tilted back to keep airway open with one hand placed under the head. Upper leg is bent at the knee and brought forward.

B. ADULT TWO-RESCUER CPR

- a. Each rescuer has specific roles:

Rescuer 1 - (is at the victim's side)

- a. performs chest compressions
- b. counts out loud
- c. switches duties with rescuer 2 every 5 cycles or 2 minutes, taking less than 5 seconds to switch

- b. Rescuer 2 - (is at the victim's head) Checks pulse.

- a. maintains an open airway
 - b. gives breaths, watching for chest rise and avoiding hyperventilation
 - c. encourages rescuer 1 to perform compressions that are fast and deep enough and to allow full chest recoil between compressions

* switches duties with rescuer 1 every 5 cycles or 2 minutes, taking less than 5 seconds to switch Minimize interruptions in chest compressions. Attempt to limit interruptions to < than 10 seconds.

* Once an advance airway is in place (such as LMA, combitube, or endotracheal tube) give breaths at a rate of 1 breath every 6 to 8 seconds (8 to 10 breaths per minute) without attempting to synchronize breaths between compressions. There should be no pause in chest compressions for delivery of breaths.

* If victim is breathing or resumes adequate breathing and no trauma is suspected, place in recovery position.

C. ADULT FOREIGN BODY AIRWAY OBSTRUCTION - RESPONSIVE VICTIM

1. Ask- "Are you choking?"
 - a. if yes, ask "Can you speak?" If no, tell the victim you are going to help.
2. Give abdominal thrusts (chest thrusts for pregnant or obese victim), avoiding compressions on the lower sternum.
3. Repeat thrusts til object is expelled or victim becomes unresponsive.
4. ADULT FBAO - VICTIM BECOMES UNRESPONSIVE
5. Activate EMS system (or send someone to activate).
6. Begin CPR (without a pulse check) starting with chest compressions.

7. After 30 chest compressions, open the victim's mouth wide and look for the object before giving breaths. If you see an object, remove it with your fingers. If you do not see an object, give a breath. If the breath does not go in, re-tilt the head and give another breath. If breaths do not go in, continue with cycles of chest compressions and ventilations until the object is expelled.
8. After you relieve choking and see the chest rise when you give 2 initial breaths, check for a pulse.
9. If no pulse and no breathing or no normal breathing (ei, gasping only), start CPR and attach an AED.
 - a. If you have a pulse, but the victim is not breathing, continue rescue breathing and check for pulse every 2 minutes.

* If victim is breathing or resumes effective breathing, and no trauma is suspected, place in recovery position.

* If you successfully relieve choking with abdominal thrusts, encourage the victim to seek immediate attention to ensure that the victim does not have a complication from abdominal thrusts.

D. ADULT FOREIGN BODY AIRWAY OBSTRUCTION - UNRESPONSIVE

1. At times the choking victim may be unresponsive when you first encounter him or her. In this circumstance you probably will not know that an airway obstruction exists. Activate the emergency response system and start CPR.

* If victim is breathing or resumes effective breathing, place in recovery position.

E. ADULT BAG-MASK VENTILATION

1. Establish unresponsiveness with recognition of no breathing or no normal breathing (ei, gasping only), Activate EMS
2. Check for carotid pulse within 10 seconds. If pulse is present but no breathing or no normal breathing (ei, gasping only), open airway with a head tilt-chin lift (suspected trauma: jaw thrust) and provide rescue breathing (1 breath every 5 to 6 seconds, about 10 to 12 breaths per minute). If pulse is absent, begin cycles of 30 chest compressions (rate of at least 100 compressions per minute) followed with 2 rescue breaths.
3. Properly position the mask to achieve an effective seal while holding the airway open by using the E-C clamp technique by using the thumb and index finger of one hand to make a "C," pressing the edges of the mask to the face. Use the remaining fingers to lift the angles of the jaw (3 fingers form an "E") and open the airway.
4. Squeeze the bag to give breaths (1 second each) while watching for chest rise. The delivery of breaths is the same whether you use supplementary oxygen or not.
 - a. If victim is breathing or resumes adequate breathing and no trauma is suspected, place in the recovery position.

PEDIATRIC

a. CHAIN OF SURVIVAL (PEDIATRIC)

- 1st Link - Prevention of Injuries and Arrest (preventing SIDS & injuries)
- 2nd Link - Early and effective bystander CPR with emphasis on chest compressions
- 3rd Link - Rapid activation of the EMS system
- 4th Link - Early and effective advanced life support
- 5th Link - Integrated post-cardiac arrest care

b. Respiratory failure or arrest is a common cause of cardiac arrest during infancy and childhood.

c. C. THE MOST COMMON CAUSES OF PEDIATRIC CARDIAC ARREST INCLUDE CONDITIONS SUCH AS:

1. SIDS
2. Poisoning
3. Drowning
4. Trauma (injury)
5. Choking
6. Severe asthma
7. Pneumonia
8. Congenital malformations
9. Complications of prematurity
10. Motor vehicle crashes

SIGNS OF SEVERE OR COMPLETE FBAO IN INFANTS & CHILDREN INCLUDE THE SUDDEN ONSET OF:

1. Weak or silent coughing
2. Inability to speak
3. Strider (a high-pitched, noisy sound or wheezing)
4. Increasing difficulty breathing

D. WAYS TO PREVENT INJURY OR DEATH

1. Buckle up - everyone in the vehicle
 - i. Children & infants in child restraint devices - < age 12 in back seat
2. Wear bicycle helmets (saves 85% head injuries)
3. Supervise children near traffic & water
4. Use smoke alarms & keep drapes and furniture away from heaters
5. Place healthy term infant to sleep on back or side
6. keep plastic bags, small objects, medications and poisons out of reach
7. Use gates to block stairways

PEDIATRIC CPR & FBAO

A. CHILD ONE - RESCUER CPR (age 1 to puberty)

1. Establish unresponsiveness- "Are you okay?" and recognition of no breathing or only gasping. If second rescuer is available, have him or her activate the EMS system.
 - a. For lone healthcare provider rescuer - if you witness child suddenly collapses, (follow the adult sequence and activate EMS (phone 911), and get the AED and use as soon as it is available for sudden, witnessed collapse.
2. Check Carotid or Femoral pulse (within 10 seconds) If pulse is present but no breathing or only gasping, provide rescue breathing beginning with 2 breaths (1 breath every 3 to 5 seconds and recheck pulse every 2 minutes) 1 second per breath, enough to make the chest rise.
3. If no pulse is present or heart rate is less than 60 bpm with signs of poor perfusion, begin cycles of 30 chest compressions and 2 breaths - push hard and fast (at least 100 compressions per minute) in center of breastbone between
4. nipples with heel of one hand, other hand on top (or 1 hand for small victims)
5. 1/3 depth (about 2 inches) of the chest with each compression. Acceptable < 18 seconds for 30 compressions.
6. After 5 cycles of CPR - if not already done (unwitnessed) If rescuer is alone, activate the EMS system and get AED/defibrillator For Child > 1 year to 8 years: check rhythm with AED, if shockable, give 1 shock (using child pads with a pediatric dose-attenuator system if available, use standard AED with adult pads if child pads are not available), then resume CPR immediately for 5 cycles starting with chest compressions. If not shockable rhythm - resume CPR immediately starting with chest compressions, for 5 cycles and check rhythm every 5 cycles; continue till EMS providers take over or victim starts to move. If pulse is present but if no breathing or only gasping, continue rescue breathing (1 breath every 3 to 5 seconds, about 20 breaths per minute).

B. CHILD 2-RESCUER CPR (15 compressions:2 ventilation ratio)

- Each rescuer has specific roles:
 - a. Rescuer 1 - (is at the victim's side)
 1. performs chest compressions
 2. counts out loud
 3. switches duties with rescuer 2 every 5 cycles (15:2) or 2 minutes, taking less than 5 seconds to switch
 - b. Rescuer 2 - (is at the victim's head)
 1. maintains an open airway and checks pulse
 2. gives breaths, watching for chest rise and avoiding hyperventilation
 3. encourages rescuer 1 to perform compressions that are fast and deep enough and to allow full chest recoil between compressions

4. switches duties with rescuer 1 every 5 cycles or 2 minutes, taking less than 5 seconds to switch

* Once an advance airway is in place (such as LMA, combitube, or endotracheal tube) give breaths at a rate of 1 breath every 6 to 8 seconds (8 to 10 breaths per minute), without attempting to synchronize breaths between compressions. There should be no pause in chest compressions for delivery of breaths.

* If victim is breathing or resumes effective breathing, place in recovery position. If witness child collapses suddenly, the lone healthcare provider should follow the adult sequence and activate the EMS (and get an AED if available) first. Then the lone rescuer should return to use an AED as soon as possible and begin CPR.

C. CHILD FOREIGN BODY AIRWAY OBSTRUCTION-RESPONSIVE VICTIM

1. Ask "Are you choking?" If yes, ask "Can you speak?" If no, tell child you are going to help.
2. Give abdominal thrusts using proper hand position (avoid Xyphoid)
3. Repeat thrusts til object is expelled or victim becomes unresponsive.
4. CHILD FBAO - VICTIM BECOMES UNCONSCIOUS
 - a. If second rescuer is available, have him or her activate the EMS system.
 - b. Begin CPR (without a pulse check) starting with chest compressions.
 - c. After 30 chest compressions, open airway and look for object,
 - d. and if you see the object, remove it. (no blind finger sweeps because it may push obstructing objects farther into the pharynx).
 - e. Then try to give a breath, if it doesn't go in, retilt the head and try to give another breath.
5. Continue with cycles of chest compressions and ventilations until the object is expelled.
6. After 2 minutes, if no one has already done so, activate EMS.
7. If you do not see an object, keep doing CPR.
8. After you relieve choking and see chest rise after giving 2 initial breaths, check for a pulse.
9. If no pulse and patient not breathing or not breathing normally (only gasping), start CPR.

* If victim is breathing or resumes effective breathing, place in recovery position.

* If you successfully relieve choking with abdominal thrusts, the victim should be encouraged to seek immediate medical attention to ensure that he/she does not have a complication from abdominal thrusts.

D. CHILD FOREIGN - BODY AIRWAY OBSTRUCTION - UNRESPONSIVE VICTIM

1. The choking victim may be unresponsive when you first encounter him or her. In this circumstance you will probably not know an airway obstruction exists.
2. Activate the emergency response system and start CPR.

* If victim is breathing or resumes breathing, place in recovery position.

E. CHILD BAG-MASK VENTILATION

1. Establish unresponsiveness and recognition of no breathing or only gasping. If a second rescuer is available, have them activate EMS.
2. Check for carotid or femoral pulse. If pulse is present but no breathing and only gasps, provide rescue breathing by opening the airway with a head tilt-chin lift (or suspected trauma: jaw thrust) 1 breath every 3 to 5 seconds (12 to 20 breaths per minute). Give each breath in 1 second (resulting in visible chest rise).
 - a. If pulse is absent or heart rate is less than 60 bpm with signs of poor perfusion, begin 30:2 cycles of compressions and ventilations. If rescuer is alone, activate EMS after 5 cycles or 2 minutes of CPR.
3. Properly position mask to achieve an effective seal while holding airway open by using the E-C clamp technique by using the thumb and index finger of one hand to make a "C" pressing the edges of the mask to the face. Use the remaining fingers to lift the angles of the jaw (3 fingers form an "E") and open the airway.
4. Squeeze the bag to give breaths (1 second each) while watching for chest rise. The delivery of breaths is the same whether you use supplementary oxygen or not. For Child 2-rescuer CPR - 15 compressions: 2 ventilation ratio.

* If victim is breathing or resumes normal breathing and no trauma is suspected, place in recovery position.

F. INFANT 1- RESCUER CPR

1. Establish unresponsiveness and recognition of no breathing or only gasping. If second rescuer is available, have him or her activate the EMS system.
2. Check brachial pulse (within 10 seconds) If breathing is absent or inadequate, but pulse is present, provide rescue breathing (1 breath every 3 to 5 seconds, about 20 breaths per minute).
3. If no pulse is present or heart rate is less than 60 bpm with signs of poor perfusion, begin cycles of 30 chest compressions (push hard, push fast)
 - a. Draw an imaginary line between the nipples. Place 2 fingers on the breastbone just below this line. This allows you to compress on the lower half of the breastbone.
 - b. Press the infant's breastbone down about 1/3 (about 1&1/2 inches) the depth of the chest. After each compression completely release the pressure on the breastbone and allow the chest to recoil or re-expand completely.
 - c. Deliver compressions in a smooth fashion at a rate of at least 100
 - i. Compressions per minute. (Acceptable < 18 seconds for 30 compressions) followed by 2 breaths (1 second each) with visible chest rise. (30:2 ratio)

4. After 5 cycles, if someone has not already done so, activate the emergency response system. If rescuer is alone, activate the EMS system. If no pulse is present (or heart rate is less than 60 bpm with poor perfusion), continue 30:2 cycles of compressions and ventilations. If signs of circulation are present but breathing is absent or inadequate, continue rescue breathing (1 breath every 3 to 5 seconds (give each breath in 1 second), about 12 to 20 breaths per minute). Check pulse about every 2 minutes.

* If victim is breathing or resumes effective breathing, place in recovery position.

G. INFANT 2-RESCUER CPR

- Each rescuer has specific roles:
 - Rescuer 1 - (is at the victim's side)
 - a. performs chest compressions with 2 thumb-encircling technique
 - b. Counts out loud
 - c. switches duties with rescuer 2 every 5 cycles or 2 minutes, taking less than 5 seconds to switch
 - Rescuer 2 - (is at the victim's head)
 - a. maintains an open airway and checks pulse (brachial pulse) provides breaths that make the chest rise
 - b. encourages rescuer 1 to perform compressions that are fast and deep enough and to allow full chest recoil between compressions
switches duties with rescuer 1 every 5 cycles or 2 minutes, taking less than 5 seconds to switch
 - c. The compression rate for 2-rescuer CPR is at least 100 compressions per minute. Until an advanced airway (LMA or endotracheal tube) is in place, the compression-ventilation ratio is 15:2.

* When an advanced airway (LMA or endotracheal tube) is in place during 2-rescuer CPR, give 1 breath every 6 to 8 seconds (8 to 10 breaths per minute) without attempting to give breaths between compressions. There should be no pause in chest compressions for delivery of breaths.

H. INFANT FOREIGN - BODY AIRWAY OBSTRUCTION - RESPONSIVE VICTIM

1. Check for serious breathing difficulty, ineffective cough, no strong cry. Confirm signs of severe or complete airway obstruction.
2. Give up to 5 back blows (slaps) and 5 quick chest compressions, (same location as chest compressions - just below the nipple line) Deliver chest compressions each with the intention of creating enough of an "artificial cough" to dislodge the foreign body.

3. Repeat step 2 till object is expelled (obstruction relieved) or victim becomes unresponsive. INFANT FOREIGN - BODY AIRWAY OBSTRUCTION - VICTIM BECOMES UNRESPONSIVE
4. If second rescuer is available, have him or her activate the EMS system.
5. Start CPR with chest compressions (without pulse check).

1. After 30 chest compressions, Open the infant's airway and look for an object. If an object is visible, remove it. Do not perform a blind finger sweep or they may push the obstructing objects farther into the pharynx.
 - a. Attempt to give a breath, if it doesn't go in, retilt the head and try another breath.
2. Continue CPR starting with compressions and ventilations until the objects is expelled.
3. After 2 minutes of CPR, if no one has called, activate the emergency response system.
4. After you relieve choking and see the chest rise when you give 2 initial breaths, check for a pulse.
5. If no pulse and no breathing or no normal breathing (gaspings only), start CPR.

* If victim is breathing or resumes effective breathing, place in recovery position.

I. INFANT BAG-MASK VENTILATION

1. Establish unresponsiveness and recognition of no breathing or only gasps.
2. Position yourself directly above the infant's head.
3. Use the E-C clamp technique to hold the mask in place
 - a. perform a head tilt-chin lift
 - b. use the thumb and index finger of each hand to make a "C," pressing around the edges of the mask
 - c. use the remaining fingers to lift the angles of the jaw (3 fingers form an "E") and open the airway
4. Press the mask against the face while lifting the jaw to hold the airway open. Try to make an airtight seal between the mask and the face.
5. Give breaths (1 second each) while watching the chest rise. The delivery of each breath is the same whether you use supplementary oxygen or not.

If the chest does not rise

 - d. perform the head tilt-chin lift again
 - e. reposition the mask on the face
 - f. be sure that the airway is open and that you have a good seal between the mask and face
 - g. try to give the breaths again
 - h. You may need to try a couple of times to give a total of 2 breaths that make the chest rise.
6. Give 1 breath every 3 to 5 seconds (12 to 20 breaths per minute).
 - a. Give each breath in 1 second where each breath should result in visible chest rise. Check pulse about every 2 minutes.
 - b. If victim is breathing or resumes adequate breathing and no trauma is suspected, place in recovery position.

FOR YOUR INFORMATION!!!

Hands only CPR for the ADULT (Outside the hospital)

If a bystander (Lay rescuer) is NOT TRAINED in CPR, the bystander should provide "Hands Only" (compression only) CPR for the "Adult victim" who suddenly collapses, with an emphasis to "PUSH HARD AND FAST" on the center of the chest, or follow the directions of the EMS dispatcher. The rescuer should continue CPR until an AED arrives and is ready for use or EMS providers take over care of the victim.

All "Trained lay rescuers" should, at a minimum, provide chest compressions for victims of cardiac arrest. If the trained lay rescuer is able to perform rescue breaths, compressions and breaths should be provided in a ratio of 30 compressions to 2 breaths. The rescuer should continue CPR until and AED arrives and is ready for use or EMS providers take over care of the victim.