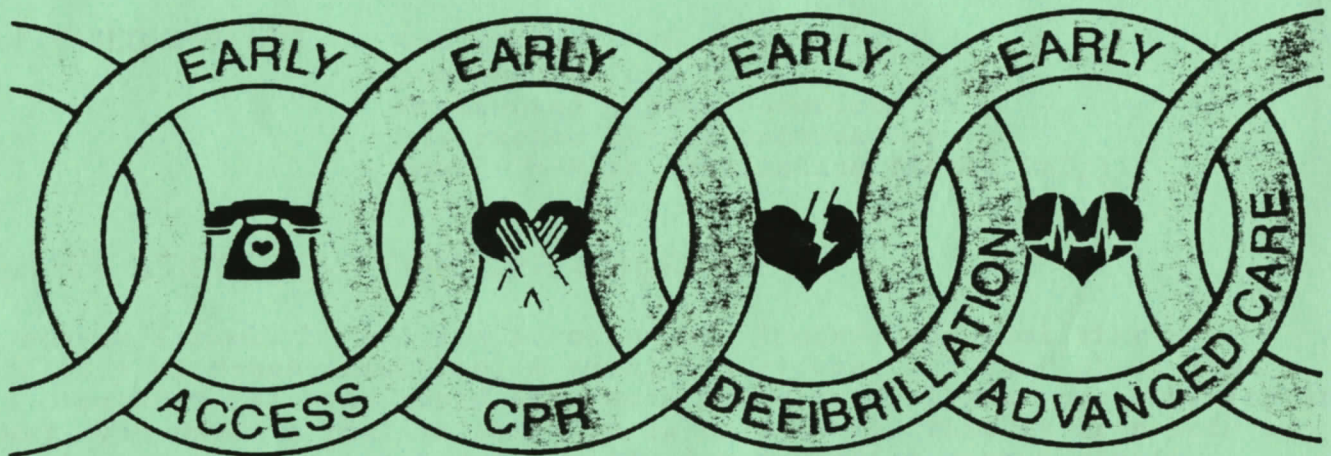


BASIC CARDIAC LIFE SUPPORT STUDY GUIDE



Study Guide Developed By:
Education Lab-UTMB
Jennie Sealy Hospital
2 West, Room 235
Galveston, TX 77555-0486
(409)772-2823
Revised 8/95

COURSE INFORMATION:

Cardiopulmonary Resuscitation (CPR) classes are held in the Education Lab, Jennie Sealy Hospital, 2 West, Room 235. For more information or scheduling, please call (409)772-2823.

The material contained in this study guide is based upon the "Standards & Guidelines for CPR & ECC", published in JAMA, October, 1992. Reproduced with permission. Heartsaver Manual: A Student Handbook for Basic Life Support, 1987.

Participants may obtain the textbook, Basic Life Support for Healthcare Providers from the Education Lab office.

To receive a Basic Life Support (BLS) Healthcare Provider completion card, you must make an 84% on the written exam as well as demonstrate acceptable manikin performance of the following skills:

ADULT, CHILD & INFANT:	One-Rescuer CPR
	Two-Rescuer CPR
	Obstructed Airway Conscious
	Obstructed Airway Unconscious
	Mouth-To-Mask Ventilation (Adult Only)

LIABILITY STATEMENT FOR CPR COURSES:

"The course for which you are enrolled may include physical strain, possibility of cross-infection, & emotional stress. If your physician has recommended that you avoid strenuous activity or limit your activity in any way, you need to realize that CPR is hard work! This is true both in practicing on the manikin and doing CPR for a cardiac arrest victim.

If you have a medical or coronary history that may be aggravated by this course, you should consult your physician & ask advice as to whether you should participate in a CPR course.

If you have reservations about being able to perform CPR on a cardiac arrest victim, you should consider this before beginning this course.

Participants will postpone CPR training if they are known to be in the active stages of an infectious disease, have reason to believe they have been exposed to infectious diseases, or have sores on their hands, mouth or face. To protect other participants from exposure, carriers of chronic infection are required to contact the Education Lab staff regarding their options prior to the course.

IF YOU HAVE ANY QUESTIONS, PLEASE DON'T HESITATE TO CALL THE EDUCATION LAB.

EXPOSURE TO COMMUNICABLE DISEASE

- Whenever possible, trained health care providers should substitute mouth-to-mask or bag-valve-mask breathing for mouth-to-mouth ventilations.

WHY SHOULD I KNOW CPR?

1. It is important to learn CPR because sudden death may occur at anytime to anyone.
2. Sudden death may be reversed if CPR is started promptly. The greatest chance of survival for an arrest victim occurs when CPR is started within 4 minutes.

WHEN SHOULD I PERFORM CPR?

CPR should be started immediately if breathing and pulse are absent and there is no legal or medical reason to withhold it. (Clear "DO NOT RESUSCITATE" orders on the physician's order sheet or reliable criteria such as tissue decomposition, rigor mortis, or decapitation). Since there are known cases of drowning victims who have been successfully resuscitated even after prolonged submersion in water, CPR should be initiated unless reliable criteria exists for withholding it.

EMERGENCY MEDICAL SYSTEM (EMS)

1. **KNOW YOUR LOCAL EMERGENCY NUMBERS:**
In Galveston County, Call 911 if the emergency is located outside of UTMB Hospitals. Call 24000 if the emergency is located within UTMB Hospitals.
2. Structured EMS systems that can be accessed quickly by telephoning 911 have recently been shown to improve survival from sudden cardiac death. As a result, upon discovery of an unresponsive adult victim, the rescuer should send someone to activate EMS immediately. If alone the rescuer should activate EMS then return promptly to begin CPR if necessary. When the emergency involves an infant (aged less than 1 year of age) or a child (aged 1 to 8 years of age) who is not breathing and without pulse, the rescuer should call for help and begin CPR immediately. CPR should be performed for 1 minute and if there is no response to the call for help, the rescuer should activate EMS at this time and then return to continue CPR. For all victims of sudden death, if another rescuer is available at the scene, the second rescuer should activate the EMS system (if not done previously) and return to assist the first rescuer, who initiated CPR.
3. CPR should be continued until the patient recovers, the EMS personnel, a physician, or another person takes over, or the rescuer is exhausted and unable to continue.
4. Most states including Texas has passed "Good Samaritan" laws. These laws promote the rendering of aid in emergency situations by reducing the fear of legal consequences.

COMMON CAUSES OF SUDDEN DEATH

1. Sudden death occurs due to a variety of illnesses or injuries including heart attacks, stroke, drug reactions, drowning, and electrical shock.
2. In infants and children, the most common cause of cardiac arrest is respiratory arrest.
 - a. Preventable accidents are the most common cause of emergency situations in infants & children.
 - b. By providing a safe environment, accidents to children could be reduced. Installing safety devices in the home is the best way to reduce these hazards. Other measures include using infant seats & seat belts in cars and teaching children respect for matches, guns, and water.
3. In adults the most common cause of cardiac arrest and sudden death is a heart attack.

HEART ATTACK

1. A heart attack is defined as death of the heart muscle due to an inadequate blood supply. Heart attacks usually occur because of underlying coronary artery disease and atherosclerosis.
2. Atherosclerosis is the gradual build-up of fatty deposits (cholesterol) in arterial walls. This build-up of deposits decreases the size of the artery and reduces blood flow. A sudden blockage of the artery supplying the heart may lead to a heart attack. Blockage of an artery supplying the brain may lead to a stroke. Atherosclerosis usually starts at an early age.
3. Several factors increase a person's risk of having a heart attack. It is generally believed that by identifying and controlling these risk factors, we can substantially reduce the risk of having a heart attack.
4. Risk factors that cannot be changed include age, heredity, and sex.
5. Risk factors that can be controlled or eliminated include cigarette smoking, high blood pressure, elevated blood cholesterol, diabetes, obesity, and an inactive life style.
 - a. Smoking - QUIT smoking or never start.
 - b. High Blood Pressure - Have your blood pressure checked regularly and see your doctor.
 - c. Elevated Blood Cholesterol - Eat low fat, low cholesterol foods (cholesterol is found in animal products such as meat, eggs and dairy products).
 - d. Diabetes - See your doctor.
 - e. Obesity - EXERCISE regularly and CONTROL your weight (through exercise you can feel better while toning the muscles, stimulating the circulation, and avoiding excess weight. It has been proven that heart attack victims who have exercised regularly have an improved survival rate).
6. The most common symptom of a heart attack is usually a feeling of tightness, pressure, fullness, or pain in the chest. It may radiate to the shoulders, neck, jaw, or either arm. The discomfort may occur suddenly and persist or may subside and return. Other signs include sweating, nausea, weakness, and shortness of breath. However, some people may not have typical symptoms. The pain may be mild and attributed to indigestion. Generally sharp, stabbing twinges of pain are not signals of a heart attack.

7. The most serious danger of a heart attack is cardiac arrest. Remember, a common reaction of a person experiencing a heart attack is denial and most arrests occur within one or two hours after the onset of symptoms. If someone is experiencing the symptoms suggestive of a heart attack, have the victim rest quietly. If symptoms persist for more than 2 minutes, call the EMS.

CPR SEQUENCE

If a victim has collapsed, the A-B-C sequence for performing CPR is the same for an adult, child or infant.

ADULT-over 8 years of age

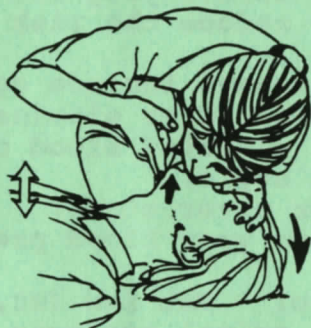
CHILD-1 to 8 year of age

INFANT-under 1 year of age

1. Establish Unresponsiveness.
2. Adult-Have someone activate EMS.
Child or Infant - Call out, "HELP!".
3. AIRWAY



4. BREATHING



5. CIRCULATION



CPR PERFORMANCE GUIDELINES

1. Establish Unresponsiveness
 - a. The first thing that should be done for a collapsed victim of illness or accident is to establish unresponsiveness by gently shaking the victim and saying, "Are you OK?". This may prevent unnecessary resuscitation if the person is asleep or has fainted.
 - b. If the victim is unresponsive and lying face down, the rescuer should turn the victim's entire body as a unit onto the back.
2. Adult - Have someone activate the EMS.
Child or Infant - Call out, "Help!".
3. Airway
 - a. In the unconscious person, the tongue falls back obstructing the airway. A pillow under the head should be removed as it may cause the tongue to further obstruct the airway.
 - b. To open the airway, properly position the head using head-tilt/chin-lift method. To perform the head-tilt/chin-lift method, the rescuer pushes down with one hand on the victim's forehead while the other hand lifts up on the chin. Hyperextension should be avoided on infants and children.
 - c. If the victim is suspected of having a neck fracture, the jaw thrust without a head-tilt should be used.
4. Breathing
 - a. Check for breathing by placing your ear by the victim's mouth and nose and LOOK for the chest to rise and fall while LISTENING for breathing and FEELING for exhalations against your cheek.
 - b. If breathing is present continue to monitor the patient by frequently checking pulse and breathing until EMS arrives. Also, place the victim in the recovery position by rolling the victim onto his/her side so the head, shoulders and torso move simultaneously without twisting. DO NOT move victim if trauma is sustained or suspected.
Child or Infant - Have someone activate EMS at this time.
 - c. If breathing is absent, pinch the victim's nostrils and place your mouth over the victim's mouth. Give 2 slow breaths watching for the chest to rise and fall. Allow the victim to exhale completely between breaths by normal relaxation of the chest.
 - d. To achieve a seal for infants, the rescuer's mouth is placed over the victim's mouth and nose.
 - e. Mouth-to-mouth breathing replaces the victim's breathing and is effective because exhaled air contains about 16% oxygen.
 - f. Failure to ventilate adequately may be due to lack of a good seal, gastric distention, or inadequate head-tilt. If the victim is wearing dentures and they are not loose, leave them in place to achieve a tight seal.
 - g. If slight gastric distention occurs (air in stomach), the rescuer should reposition the airway; but make no other attempts to relieve the distention unless ventilation is compromised.
 - h. If the victim vomits, the rescuer should turn the victim's entire body to one side, clear out the mouth, and continue CPR.

5. Circulation

- a. Check for a pulse for 5-10 seconds to see if the heart is beating and circulating blood. In adults and children, feel for the carotid pulse in the neck. In infants, feel for the brachial pulse in the arm.
- b. If pulse is present but breathing is absent, continue rescue breathing until EMS arrives.
Child or Infant - Send someone to activate EMS at this time and continue rescue breathing.
- c. If pulse is absent, start chest compressions. This replaces the victim's heartbeat and circulates blood to the brain and other vital organs.
Child or Infant - Send someone to activate EMS at this time and begin chest compressions. Anytime chest compressions are performed, rescue-breathing must also be continued.
- d. Effective chest compressions depend on appropriate rate, depth, and compression to breathing ratio (see summary for specific information).
- e. Proper hand location:
Adult - Run middle and index fingers up the rib cage and locate the substernal notch with your middle finger. With index finger on sternum, place the heel of your hand next to index finger on lower half of sternum. Place second hand on top of first.
Child - Same location as adult but use the heel of one hand.
Infant - Draw an imaginary line across the nipples. Place two fingers, one finger width below the nipple line on the sternum.
- f. If chest compressions are interrupted, blood flow and blood pressure decrease to zero; so CPR should never be interrupted except in certain circumstances.
- g. The single rescuer should check the victim's pulse and breathing after the first minute of CPR and every few minutes thereafter.
- h. Complications of chest compressions, even when performed correctly, include: fractured ribs, fractured sternum, rib-cartilage separations, contusions of the heart, lacerated liver, and pneumothorax. However, since the pulseless victim will surely die without intervention, there is no other condition in which chest compressions are too dangerous to perform.

WHEN HELP ARRIVES

1. Alternating 1-Rescuer CPR on an Adult or Child:
The American Heart Association (AHA) suggests that lay people learn only 1-Rescuer CPR. Lay people alternate performing 1-Rescuer CPR until help arrives.
2. 2-Rescuer CPR on an Adult or Child:
The AHA suggests that the health care professionals learn 2-Rescuer CPR for adults and children. The way a professional rescuer enters a CPR situation depends on a variety of circumstances. One method includes the arrival of another professional rescuer to assist with CPR.
 - a. The 2nd professional rescuer:
 - (1) Identifies self, "I know 2-Rescuer CPR. May I help?".
(Make sure that the EMS has been called)

- (2) Waits for the 1st rescuer to complete the ratio of compressions and breaths.
 - (3) Locates hand placement for compressions while the 1st rescuer checks pulse. In no pulse:
 - (4) **START CHEST COMPRESSIONS.**
- b. The compression to breathing ratio is now 5:1. Breaths are delivered after every 5th compression during the pause.
- c. To change positions during 2-Rescuer CPR, the rescuer on the chest gives a clear signal to change and finishes the fifth compression. Any five word phrase replaces the usual 1-5 count (change, two, three, four, five). The rescuer at the head gives one ventilation and moves to the chest finding hand position, but does not begin compressions. The rescuer who was on the chest, moves to the victim's head, and feels for a pulse. If there is no pulse; the rescuer on the chest then begins chest compressions.

ADULT (OVER 8 YRS.)

Establish Unresponsiveness
Shake & Shout, "Are you OK?"
Position victim



Have someone ^{one} activate EMS

Airway
Head tilt/chin lift or
jaw thrust.



Breathing
Check breathing. If absent,
pinch nose & give 2 slow
breaths.



Circulation
Check carotid pulse. If
absent, start chest
compressions.



Compressions
Technique/Location - Place
stacked heels of both hands
on lower half of sternum.



Rate 80 to 100 minute
Depth 1-1/2 to 2 inches

Compression to breath ratio/
of cycles in a minute
1-Rescuer 15:2 / 4 cycles
in 1 minute
2-Rescuer 5:1

Rescue Breaths
Pulse present but no
breathing 12 / minute or
1 every 5 seconds.

CHILD (1 TO 8 YRS.)

Establish Unresponsiveness
Shake & Shout, "Are you OK?"
Position victim

Call out, "HELP!"

Airway
Head tilt/chin lift or
jaw thrust.

Breathing
Check breathing. If absent,
pinch nose & give 2 slow
breaths.

Circulation
Check carotid pulse. If
absent, have someone call
EMS & start chest
compressions.

Compressions
Technique/Location - Place
the heel of one hand on
lower half
of sternum.



Rate 100 / Minute
Depth 1 to 1-1/2 inches

Compression to breath ratio/
of cycles in a minute
1-Rescuer 5:1 / 20 cycles
in 1 minute
2-Rescuer 5:1 / 20 cycles
in 1 minute.

Rescue Breaths
Pulse present but no
breathing 20 / minute or
1 every 3 seconds.

INFANT (UNDER 1 YR.)

Establish Unresponsiveness
Shake & Shout, "Are you OK?"
Position victim

Call out, "HELP!"

Airway
Head tilt/chin lift or
jaw thrust.

Breathing
Check breathing. If absent,
cover mouth & nose and give
2 slow breaths.

Circulation
Check brachial pulse. If abs:
have someone call EMS & sta:
chest compressions.



Compressions
Technique/Location - Place
2 fingers -
1 finger width
below nipple
line on
sternum.



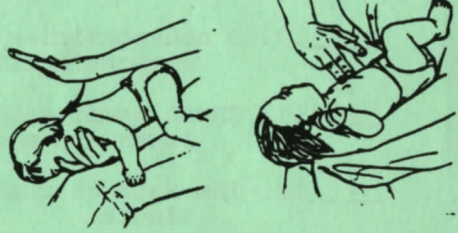


Rate at least 100 / Minute
Depth 1/2 to 1 inch

Compression to breath ratio/
of cycles in a minute
1-Rescuer 5:1 / 20 cycles
in 1 minute
2-Rescuer (Not performed on
infant)

Rescue Breaths
Pulse present but no breath:
20 / minute or 1 every
3 seconds.

CONSCIOUS CHOKING VICTIM

GENERAL INFORMATION	ADULT/CHILD SEQUENCE	INFANT SEQUENCE
<p>Approximately 3,000 deaths occur each yr. in the U.S. due to choking. Choking occurs when food or a foreign object blocks the air passage preventing air exchange.</p> <p>When someone is choking, early recognition is extremely important. The victim may be clutching the throat displaying the "Universal Distress Signal".</p> <p>IDENTIFY BREATHING DIFFICULTIES DUE TO CHOKING</p> <p>Look for signs of total airway obstruction: no air exchange & inability to cough or speak.</p> <p>Look for signs of partial airway obstruction with poor air exchange: a weak, ineffective cough, high-pitched noises while inhaling, & increasing breathing difficulty.</p> <p>If victim is able to talk & cough: monitor.</p> <p>If victim is a total obstruction or partial obstruction with poor air exchange: they need help.</p>	<p>IDENTIFY BREATHING DIFFICULTIES DUE TO CHOKING</p> <p>Ask victim, "Are you choking?"</p> <p>Perform Heimlich - Place fist above navel. Grasp fist with other hand. Press into abdomen with quick inward, upward abdominal thrusts until the obstruction is relieved or the victim becomes unconscious. Perform these thrusts in series of 5, reassessing hand placement & checking airway opening between each series.</p>  <p>For pregnant or obese victims use chest thrusts.</p> 	<p>IDENTIFY BREATHING DIFFICULTIES DUE TO CHOKING</p> <p>Place infant close to ear & assess for air exchange.</p> <p>Perform 5 back blows & 5 chest thrusts - Supporting infant's head, place infant face down over your forearm. With heel of hand perform 5 back blows between shoulder blades. Brac infant's head & turn over onto back. Perform 5 chest thrusts with 2 fingers which are placed 1 finger width below nipple line (just like chest compressions except slower). Repeat back blows & chest thrusts until obstruction is relieved or victim becomes unconscious.</p> 

Unconscious Choking Victim

1. Establish Unresponsiveness
2. Activate EMS
3. Position airway with head tilt/chin lift or jaw thrust.
4. Check for breathing. If absent, give 2 slow breaths. If victim's chest rises, check pulse. If victim is obstructed (chest will not rise), reposition the victim's head and give 2 more slow breaths.
5. If victim's chest rises, check pulse. If victim is obstructed (chest will not rise), kneel astride victim's thighs, place heel of open hand above navel with other hand on top. Perform abdominal (manual) thrust multiple times (up to 5) for adult. For infant perform 5 back blows and 5 chest thrusts (same technique as conscious choking infant).
6. Perform tongue-jaw lift and look for object. Blind sweep an adult. Sweep only if object is visible for child or infant to avoid pushing the object further into the airway. Repeat sequence at step 3 above.

Conscious Choking Victim becomes Unconscious

If you are present when a choking victim loses consciousness, activate EMS, then perform the finger sweep (only if object is visible for an infant or child). Then continue with same step above as for unconscious choking victim, begin with Step 3.

BASIC LIFE SUPPORT PRACTICE EXAM

TRUE OR FALSE

- T 1. The most serious danger of a heart attack is a cardiac arrest.
- T 2. During mouth-to-mouth breathing, the victim exhales by normal relaxation of the chest.
- T 3. Two-rescuer CPR on a child is performed by following the same sequence as two-rescuer adult CPR.
- T 4. The ratio of compressions to ventilations in infant and children is 1:5.
- F 5. Blind finger sweeps are performed on all age groups.
- T 6. Cardiac arrest in infants and children is usually the result of a respiratory arrest.
- T 7. Outside the hospital, if a rescuer finds an unconscious breathing child, the rescuer should activate the EMS & monitor the victim.
- T 8. Rescue breathing for a child with a pulse is 20 per minute or one breath every three seconds.
- T 9. Manual thrusts on a child with an obstructed airway are performed on the abdomen just above the navel.
- T 10. A non-physician may discontinue CPR if a physician assumes responsibility.
- F 11. Chest compressions are performed on a child by using the tips of the index and middle fingers on one hand.
- T 12. The rate of chest compressions for an infant is at least 100 times per minute.
- T 13. If the rescuer is alone with a child or an infant cardiac arrest victim, and there is no possibility of help arriving, the rescuer should perform CPR for one minute, and then activate the EMS (if phone is close).
- T 14. The most common reaction of a heart attack victim is denial.
- T 15. Taking time to establish unresponsiveness may help prevent unnecessary resuscitation and prevent possible harm to a victim that is asleep or has fainted.
- T 16. During the initial assessment, the pulse should be checked after the first 2 ventilations.
- T 17. While checking for breathing if the rescuer sees chest movement in an unconscious victim, the rescuer should also listen and feel for air exchange.
- F 18. Chest compression for an adult victim are performed in the middle of the sternum.
- T 19. Once CPR is started on an infant or child, the rescuer should reassess the victim after one minute of CPR (20 cycles of compressions and ventilations).
- F 20. Cholesterol is found in grains and cereals.

ANSWERS AND LOCATION OF ANSWERS IN BASIC LIFE SUPPORT STUDY GUIDE

1. True Pg. 3 (Heart Attack) #7
2. True Pg. 5 (CPR Performance Guidelines) #4c
3. True Pg. 6 (When Help Arrives) #1 and #2
4. False Pg. 8 Columns 2 and 3
5. False Pg. 9 Lower Columns (*Conscious becomes Unconscious*) Column 1 #
and Column 2 #3
6. True Pg. 2 (Common Causes of Sudden Death) #2
7. True Pg. 5 (CPR Performance Guidelines) #4b
8. True Pg. 8 Column 2
9. True Pg. 9 Lower Column 1 (*Conscious becomes Unconscious*) #5
10. True Pg. 2 (Emergency Medical System) #3
11. False Pg. 8 Column 2
12. True Pg. 8 Column 3
13. True Pg. 6 (Circulation) #5g
14. True Pg. 3 (Heart Attack) #7
15. True Pg. 4 (CPR Performance Guidelines) #1a
16. True Pg. 8 Columns 1, 2, and 3
17. True Pg. 5 (CPR Performance Guidelines) #4a
18. False Pg. 8 Column 1
19. True Pg. 8 Columns 2 and 3
20. False Pg. 3 (Heart Attack) #5c