BLS UPDATE  
(The following was taken from AHA Currents Magazine)

The 2005 American Heart Association for CPR and Early Cardiac Care are based on the largest review of literature ever published. The process was organized by the International Liaison Committee on Resuscitation and involved 380 international resuscitation experts over a 36 – month period. The scientists met for a final debate and discussion in January 2005 at an international conference hosted by the AHA. You can read the worksheets prepared as part of the evidence evaluation process at the AHA website (www.C2005.org).

Changes include simplifying and emphasizing the role of the basic life support as fundamental to improving survival from cardiac arrest. All rescuers must deliver high-quality CPR: they must provide compressions of adequate depth and number, allow adequate chest recoil after each compression, and minimize interruptions in chest compressions. The most important message in the 2005 guidelines is that high-quality CPR will save lives, and all victims of cardiac arrest should receive high-quality CPR.

If your patient has a down time of 4-5 minutes or less you should defibrillate as soon as available. If the patient has a downtime of 4-5 minutes and greater you will do 5 cycles of CPR (about 2 minutes) before attempting defibrillation. In 2 out of 3 studies, when the EMS call-to-response interval was 4 to 5 minutes or longer, a period of 1-1/2 to 3 minutes of CPR before defibrillation was associated with improved survival.

Many of the changes in BLS recommended in 2005 are designed to simplify CPR recommendations (including eliminating differences in technique for different ages when possible), increase the number and quality of chest compressions delivered, and increase the number of uninterrupted chest compressions.

A universal compression-to-ventilation ratio of 30 to 2 is recommended for lone rescuers for victims of all ages (except newborns). This 30:2 compression-to-ventilation ratio also applies to healthcare providers performing 2 rescuer CPR for adult victims until advanced airway (eg, endotracheal tube, esophageal-tracheal combitube [combitube], or laryngeal mask airway [LMA]) is in place. Once an advanced airway is in place, 2 rescuers should no longer provide cycles of CPR with pauses in compressions to give rescue breaths. Breaths should be given once every 8 seconds simultaneously with compressions.

Before an advanced airway is in place, rescuers should perform about 5 cycles of CPR after shock delivery and before the next rhythm check. Once an advanced airway is in place, rescuers should perform about 2 minutes of CPR after shock delivery and before the next rhythm check.
For 2 rescuer infant and child CPR for healthcare providers, rescuers should use a 15:2 compression-to-ventilation ratio.

Infant age is 0 to 1 year of age.

Child CPR guidelines healthcare providers apply to victims from about one year of age to the onset of puberty (about 12 to 14 years old), as defined by the presence of secondary sex characteristics (eg. Breast development in girls, armpit hair in boys). Hospitals (particularly children’s hospitals) or pediatric intensive care units may choose to extend the use of PALS (Pediatric life support) guidelines to pediatric patients of all ages (generally up to about 16 to 18 years old) rather than use puberty as the cutoff for application of PALS versus ACLS (Advanced Cardiac Life Support) guidelines.

For the lay rescuer child CPR guidelines are age 1 to 8 years of age, 55 pounds, or about 50 inches.

Healthcare providers will continue to use the cutoff of 8 years old for use of AED child pads or child attenuator system (to reduce the AED dose). However, because hypoxic (asphyxial) arrest remains the most common cause of cardiac arrest in children through adolescence, healthcare providers should apply the child CPR guidelines and sequence (eg. CPR first, and 15:2 compression–to-ventilation ratio for 2 rescuer CPR) for victims aged 1 year to the onset of puberty.

In general, the lone healthcare provider will phone first (and get the AED if available and then provide CPR and use the AED) for an unresponsive adult. In general, the lone healthcare provider will provide “CPR first” (and will activate the emergency response system after about 5 cycles or 2 minutes of CPR) for an unresponsive infant or child. The sequence of rescue actions, however, should be tailored to the most likely cause of arrest. If a victim of any age has a sudden witnessed collapse, the collapse is likely to be cardiac in origin, and the healthcare provider should activate the emergency response system, get an AED (when available), and return to the victim to provide CPR and use the AED when appropriate.

The AED should be used as soon as it is available for victims of witnessed sudden collapse.

If a victim of any age has a likely hypoxic (asphyxial) arrest, such as a drowning, the lone healthcare provider should give 5 cycles (about 2 minutes) of CPR before leaving the victim to activate the emergency response system and retrieve the AED.
Opening the airway and stabilizing the spine for the trauma victim:

The healthcare provider should use the head tilt-chin lift technique to open the airway of a trauma victim unless cervical spine injury is suspected. The healthcare provider should open the airway using a jaw thrust without extension.

If this maneuver does not open the airway, the healthcare provider should use a head tilt-chin lift technique because opening the airway is a priority for the unresponsive trauma victim.

Healthcare providers should manually stabilize the head and the neck rather than use immobilization devices during CPR for victims with suspected spinal injury.

Check for adequate breathing in adults and the presence or absence of breathing in the infant and child:
The BLS healthcare provider checks for adequate breathing in adult victims. If adequate breathing is not present, the rescuer should give 2 rescue breaths. The BLS healthcare provider check for presence or absence of breathing in the infant or child and gives 2 breaths if the infant or child is not breathing.

Attempt to give 2 effective breaths for infant, child:
Healthcare providers should try a couple of times to deliver 2 effective breaths (breaths that cause visible chest rise) to the infant or child.

Rescue breathing without chest compressions:

If the unresponsive victim is not breathing but has a pulse, the healthcare provider will give rescue breathing without chest compressions. The provider will deliver 10 to 12 breaths per minute for an adult (approximately 1 breath every 5 or 6 seconds) and 12 to 20 breaths per minute for an infant or child (approximately 1 breath every 3 to 5 seconds).

Rescue breaths with chest compressions:

All rescuers should deliver each rescue breath during CPR (via mouth-to-mouth, mouth to shield, mouth to mask, or bag mask, or via advanced airway. (With or without supplementary oxygen) over 1 second. The volume of each rescue breath should be sufficient to produce visible chest rise. Rescuers should avoid delivering more breaths than are recommended or breaths that are too large or too forceful.
It is impossible to estimate the tidal volume delivered during rescue breaths, although an adult ventilating bag (volume of one to two liters) is required to deliver sufficient volume to produce visible chest rise in an adult. The rescuer will have to depress a 1-liter bag about halfway and a 2-liter bag by about one third when delivering rescue breaths to an adult victim, but the volume delivered should produce visible chest rise.

**Chest compressions recommended for symptomatic Bradycardia in a infant or child:**

If the patient has adequate oxygenation and ventilation and the heart rate of the infant or child patient is less than 60 BPM with signs of poor systemic perfusion, the healthcare provider should begin chest compressions.

Emphasis on chest compression depth and rate, chest wall recoil, and minimal interruptions:

Effective chest compressions are essential to provide blood flow during CPR. The 2005 guidelines emphasize that the rescuer should “push hard, push fast, and allow the chest to recoil after each compression.”

The most effective chest compressions are produced if rescuers push hard, push fast, at a rate of 100 times per minute, allow full chest recoil after each compression, and minimize interruptions of compressions.

Healthcare providers should interrupt chest compressions as infrequently as possible and should limit interruptions to no more than 10 seconds at a time except for specific interventions such as insertion of an advanced airway or use of a defibrillator. Interruptions for rescue breaths or pulse checks should take less than 10 seconds.

**Rescuers should change compressors every 2 minutes:**

When more than 1 rescuer is present, rescuers should change “compressor” roles about every 2 minutes or 5 cycles of CPR (1 cycle of CPR = 30 compressions and 2 rescue breaths). Rescuers should try to complete the switch in 5 seconds or less.

Rescuers can use 1 or 2 hands for chest compressions at the nipple line for the child: For chest compressions on children, rescuers should use the heel of one or two hands to compress the lower half of the sternum to a depth of one third to one half the chest thickness. If two hands are used, hand placement is the same as that used for compression of adult victims (the depth of compression will be different). Rescuers should compress at about the nipple line.
Refinement of instructions for chest compressions in infants during 2-rescuer CPR:

Healthcare providers should use the 2 thumb-encircling hands technique for 2-rescuer CPR for infants. With this technique the healthcare provider forcefully compresses the sternum with the thumbs while using the fingers to squeeze the thorax.

Compression-to-ventilation ratios for infants and children:

Lone healthcare providers should use compression –to-ventilation ratio of 30:2 for infants, children, and adults. Rescuers performing 2-rescuer CPR should use a 15:2 ratio for infants and children. 2-rescuer adult CPR ratio is still 30:2.

2-rescuer CPR with advanced airway:

Healthcare providers should deliver cycles of compressions and ventilations during CPR when there is no advanced airway in place. Once an advanced airway is in place (ET tube/Combitube) for infant child and adult victims, 2 rescuers no longer deliver cycles of compressions interrupted with pauses for ventilation. Instead, the compressing rescuer should deliver 100 compressions per minute continuously, with out pauses for ventilation. The rescuer delivering rescue breaths should give 8 – 10 breaths per minute for infant, child, and adult victims and should be careful to avoid delivering an excessive number of ventilations. A ventilation rate of about 8 to10 breaths per minute will be the equivalent of giving 1 breath about every 6 to 8 seconds.

Streamlining actions for relief of foreign-body airway obstruction:

Terms to distinguish choking victims who require intervention (eg. Abdominal thrusts or back slaps and chest thrusts) from those who do not have been simplified to refer only to signs of mild versus severe airway obstruction. Rescuers should act if they observe signs of severe airway obstruction: poor air exchange and increased breathing difficulty, a silent cough, cyanosis, or inability to speak or breath. Rescuers should ask 1 question: “are you choking?” if the victim nods yes, help is needed.

If the victim becomes unresponsive, all rescuers are instructed to activate the emergency response number at the appropriate time and provide CPR. There is one change from 2000: every time the rescuer opens the airway to deliver rescue breaths, the rescuer should look in the mouth and remove an object if one is seen. No blind finger sweeps regardless of patients age. The tongue jaw lift is no longer performed.
Defibrillation:

The changes recommended in the 2005 guidelines are designed to minimize interruptions in chest compressions.

Immediate defibrillation is appropriate for all rescuers responding to sudden witnessed collapse with an AED on site (for victims greater than or equal to 1 year of age). Compression before defibrillation may be considered when EMS arrival at the scene of sudden collapse is greater than 4-5 minutes after the call. One shock followed by immediate CPR, beginning with chest compressions, is used for attempted defibrillation. The rhythm is checked after 5 cycles of CPR or 2 minutes.

For attempted defibrillation of an adult the dose using a monophasic manual defibrillator is 360j.

The ideal defibrillation dose using a biphasic defibrillator is the dose at which the device waveform has been shown to be effective in terminating V-fib. The initial selected dose for attempted defibrillation using a biphasic manual defibrillator is 150j to 200j for biphasic truncated exponential waveform or 120j for a rectilinear biphasic waveform. The second dose should be the same or higher. If the rescuer does not know the type of biphasic waveform in use, a default dose of 200j is acceptable.

For children 1 to 8 years of age, rescuers should use an AED with a pediatric dose-attenuator system if one is available. If child pad system is not available use adult AED pads.

There is no recommended defibrillation for infants.

Every healthcare provider should purchase the 2005 AHA BLS Provider Handbook. It can be purchased on-line at:

www.worldpoint-ecc.com
# AHA BLS 2006 Updates

<table>
<thead>
<tr>
<th>MANEUVER</th>
<th>ADULT ADOLESCENT AND OLDER</th>
<th>CHILD 1 YEAR TO ADOLESCENT</th>
<th>INFANT UNDER 1 YEAR OF AGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACTIVATE</strong></td>
<td>ACTIVATE WHEN VICTIM FOUND UNRESPONSIVE. IF ASPHYXIAL ARREST LIKELY CALL AFTER 5 CYCLES (2 MINUTES) OF CPR</td>
<td>ACTIVATE AFTER PERFORMING 5 CYCLES OF CPR FOR SUDDEN, WITNESSED COLLAPSE, ACTIVATE AFTER VERIFYING THAT VICTIM UNRESPONSIVE</td>
<td></td>
</tr>
<tr>
<td>CALL 911</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **AIRWAY** | HEAD TILT CHIN LIFT (SUSPECTED TRAUMA USE JAW THRUST) | | |
| **BREATHS** | 2 BREATHS AT 1 SECOND /BREATH | 2 EFFECTIVE BREATHS AT 1 SECOND /BREATH | |
| INITIAL | | | |
| RESCUE BREATHING WITHOUT CHEST COMPRESSIONS | 10 TO 12 BREATHS /MIN APPX. 1 BREATH EVERY 5 6 SECONDS | 12 TO 20 BREATHS /MIN APPX. 1 BREATH EVERY 3 TO 5 SECONDS | |
| RESCUE BREATHS FOR CPR WITH ADVANCED AIRWAY | 8 TO 10 BREATHS /MIN (APPX. 1 BREATH EVERY 6 TO 8 SECONDS) | | |

| **CIRCULATION** | CAROTID CAN USE FEMORAL IN CHILD | BRACHIAL FEMORAL | |
| PULSE CHECK (10 SEC) | CENTER OF CHEST, BETWEEN NIPPLES | JUST BELOW NIPPLE LINE | |

| **COMPRESSION LANDMARKS** | | |
| | | |

| **COMPRESSION METHOD** | 2 HANDS HEEL OF 1 HAND OTHER HAND ON TOP | 2 HANDS HEEL OF 1 HAND OTHER HAND ON TOP 1 HAND HEEL OF 1 HAND ONLY | 1 RESCUER 2 FINGERS 2 RESCUER 2 THUMB - ENCIRCLING HANDS |
| PUSH HARD AND FAST ALLOW COMPLETE RECOIL | | | |

| **COMPRESSION DEPTH** | 1 1/2 - 2 INCHES | APPX. 1/3 - 1/2 THE DEPTH OF THE CHEST | |
| **COMPRESSION RATE** | APPROXIMATELY 100 TIMES PER MINUTE | | |
| **COMPRESSION RATIO** | 30:2 (1 - 2 RESCUER) | 30:2 SINGLE RESCUER 15:2 2 RESCUERS | |

| **DEFIBRILLATION** | CPR - SHOCK 200 J - CPR - SHOCK 300 J - CPR - SHOCK 360 J | | |

| **AED** | USE ADULT PADS. DO NOT USE CHILD PADS. PERFORM 5 CYCLES / 2 MINUTES OF CPR BEFORE SHOCK IF PATIENT HAS BEEN DOWN LONGER THAN 4 TO 5 MINUTES | AFTER 5 CYCLES OF CPR USE CHILD PADS FOR CHILDREN 1 TO 8 YEARS OLD IF CHILD PADS ARE NOT AVAILABLE USE ADULT PADS. USE AED AS SOON AS AVAILABLE FOR SUDDEN COLLAPSE | NO RECOMMENDATION FOR INFANTS LESS THAN 1 YEAR |

| **FOREIGN BODY AIRWAY OBSTRUCTION** | ABDOMINAL THRUSTS | BACK SLAPS AND CHEST THRUSTS | |