Every health care worker is familiar with the “ABCs” (airway, breathing, circulation) of cardiopulmonary resuscitation (CPR). It has been the hallmark of the American Heart Association (AHA) guidelines since the organization’s formation. Since 2011, the “ABCs” of CPR were revised and renamed “CAB.” These standards, promote circulation as the primary focus of the CPR guidelines. “CAB” stands for chest compressions, airway and breathing; with emphasis on chest compressions. AHA recommends chest compressions or compression-only CPR for the lay public. Instructions from a 911 operator will only advise continued chest compressions in the public setting, with at least 100 -120 compressions per minute by applying a firm downward pressure on the center of the sternum. Research indicates the optimal rate of compression is actually nearer to 130 compressions per minute with a two to 2.4-inch depth (5 cm) for each compression for an adult. The AHA continues to recommend that the airway and breathing portions of CPR be retained for healthcare providers because in most health care settings an Ambu-bag and a team approach for caring for the victim is available. The 2016 standards only added a few new components to the 2011 standards. Specifically, now for all age categories the recommended rate of compressions is at least 100-120 compressions per minute which is different from previous recommendations of at least 100 compressions. In addition, for the adult victim, the 5 cm or 2-2.4 inche depth is now considered the standard, up from at least 2 inches for the adult victim in 2011.

For adult victims (defined by AHA as anyone who shows signs of puberty—underarm or chest hair development in males and breast development in females), the new standards for health care providers for one-person CPR are as follows:

1. Establish scene safety – is it safe to respond?
2. Establish unresponsiveness—shake and shout.
3. Activate EMS. Call 911 or local emergency telephone number or call a code.
4. Check for circulation and breathing at same time by checking the carotid pulse for no less than five seconds but no more than 10 seconds, and looking to see if the chest is rising and falling for breathing signs.

5. Open the airway using head tilt chin lift unless neck trauma is suspected. (then use jaw thrust method).
6. If the victim is not breathing, give two breaths (one second each, enough for the chest to rise), pinching the nose and encircling the mouth then continue with chest compressions.
7. The ratio of chest compressions to breaths is 30 compressions to two ventilations.
8. The compression rate should be at least 100 - 120 compressions per minute (130 is optimal).
9. Continue CPR until help arrives or until the rescuer becomes physically exhausted.

In a team approach using an Ambu-bag, once the victim has been determined to be unresponsive and without a pulse, a hospital code or 911 call is made and CPR is initiated. One team member will perform chest compressions while a second member of the team maintains an open airway and a good seal on the face-mask of the Ambu-bag. This allows a third member of the team to successfully administer ventilations once every six seconds using an asynchronous technique to coincide with the conclusion of a chest compression. In the team approach, roles should be switched every two minutes or when the compressor asks for a switch due to fatigue.

The standards for children (cited by AHA as 1-year-old to those with signs of puberty) are exactly the same as for adults in all aspects for one person rescue except that the chest compressions are performed with the heel of one or two hands to a depth of two inches or...
1/3 of the width of the child’s chest whichever is greater. The ratio of 30 compressions to two breaths for one-person rescue remains the same; however, in a two-person rescue, 15 compressions are followed by two breaths.

For infants (those less than 1-year-old), CPR has always been slightly different. Circulation is checked by feeling for the brachial artery instead of the carotid artery and compressions are done with two fingers on the sternum, one finger’s width below the imaginary nipple line, with compressions at a depth of 1 1/2 inches or 1/3 of the width of the infant’s chest whichever is greater. If two people are available, the preferred compression technique for an infant is performed with a “two thumbs encircling hand technique” where the hands encircle the infant chest and the thumbs are placed on the lower third of the sternum away from the xiphoid process. Fifteen compressions are then performed followed by two breaths. For one-person CPR, the ratio of 30 compressions to two breaths, starting with compressions instead of opening the airway, is the same for all three age groups—adult, child and infant—in the standards.

The emphasis on continuous chest compressions is based on research that demonstrates a very biologically plausible explanation. Chest compressions build up an artificial blood pressure in the body with the goal to move oxygenated blood to the brain. The best one can do is about 20 percent of normal pressure during active compressions; however, when the compressions cease, blood pressure goes back to zero. Therefore, the team approach of attempting to give continuous chest compressions is the best case for survival if advanced care, such as intubation or giving cardiac drugs from a crash cart, is not available.

Additionally, when an Automatic External Defibrillator (AED) is promptly utilized, survival rates dramatically improve. The universal steps on any AED are to turn the unit on (usually by opening it up), apply the pads so that there is good skin to pad contact, take an EKG analysis (the machine will do this automatically or ask that you push the analyze key), give a shock, if advised. (the machine decides if the EKG reading is a shockable rhythm or not and only powers the pads up to deliver a shock if there is a shockable rhythm). When using an AED, the person who retrieved the unit should work around the team administering CPR until the AED pads are on the victim and the unit signals that it is ready to take an EKG reading. The AED will determine if the victim’s rhythm is shockable, and if so, will charge the unit in preparation for the electrical discharge to the victim’s chest. Caution should always be taken when applying the pads so that good skin-to-pad contact occurs and the pads are not placed over a pacemaker or transdermal patch (including a nitroglycerin patch). Other factors to consider when using an AED are the immediate surroundings. The human body is a conductor of electricity; therefore, when the pads are discharged, it is important that rescuers are not in contact with the victim and that the victim and rescuers are not in contact with water or metal that might inappropriately conduct the electrical charge.

The only other new recommendation for CPR from the AHA has to do with an avulsed tooth. If a victim loses a tooth, then the recommendation is to try to replace the lost tooth back into the mouth (which is painful) or to find a cup of milk and put the tooth in the cup of milk and send it with the victim to the emergency room when help arrives.

For first aid, the only new recommendation from the AHA involves the use of an epi-pen. If a victim is experiencing an anaphylactic reaction and then have an epinephrine pen, then if after delivering the first dose (by jabbing the pen into their thigh muscle (through clothing) and waiting 10 seconds – removing the pen and rubbing or massaging the injection site for 10 seconds) the victim does not respond after 5-10 minutes. Then the AHA now recommends to give a second epi-pen dose to the victim if it is available.

The “CAB” approach for CPR has improved success rates for CPR alone from an abysmal four percent to double digits; ongoing research continues to assess improved survival rates using “CAB” plus AED which may actually exceed 20 percent. This is a significant improvement from the past which, at best, was about 12-14 percent with an AED. Future equipment in development includes an automatic chest compression vest similar to shock trousers, and an Ambu-bag regulator that prompts the rescuer to give ventilations. Regardless of available aids, CPR recertification will include the new “CAB” standards and techniques that emphasize rapid, hard compressions that concentrate on building and maintaining blood pressure in the body with minimal interruptions for a successful CPR outcome.