



## UTSW/BioTel EMS TRAINING BULLETIN June 1, 2015

### EMS TB 15-005

## Adult CPR Update: Change to “Continuous Chest Compressions” (“CCC”)

### Purpose:

1. To set forth for UTSW/BioTel EMS Providers updated **Adult** CPR practice guidelines, changing from 30-to-2 to CCC CPR, effective June 1, 2015.
  - a. Definitions:
    - i. “30-to-2” = Synchronized ratio of 30 compressions to 2 ventilations, pausing compressions briefly to deliver ventilations
    - ii. “CCC” = Uninterrupted, continuous chest compressions, with independent ventilations delivered without pausing chest compressions
    - iii. “Adult” = For CPR and Basic Life Support, patients at least 8 years of age

### Background:

1. High-quality CPR is the single most important determinant of good patient outcome and survival to hospital discharge after out-of-hospital cardiac arrest.
2. Current UTSW/BioTel EMS System Guidelines for Therapy advise for **adult** cardiac arrest victims at least 8 years of age the standard 30-to-2 CPR chest compression-to-ventilation ratio, with brief pauses in chest compressions to deliver ventilations.
3. A recent National Institutes of Health (NIH)/Resuscitation Outcomes Consortium (ROC) clinical trial and data from several EMS agencies in North America suggest that an alternative CPR method may be at least as effective and easier to perform properly.
4. That alternative method is CCC, wherein continuous chest compressions are delivered without interruption for ventilations, and ventilations are delivered **without** coordination with chest compressions.
  - a. CCC changes the **ratio** of compressions to ventilations, and it removes the brief pauses in compressions to deliver ventilations employed with standard CPR.
  - b. Rather than coordinating chest compressions and ventilations, the chest compressor and the rescuer delivering ventilations work independently.
5. Several UTSW/BioTel EMS agencies (and other U.S. EMS agencies) have been using CCC for adult CPR, e.g. in the context of the now-completed ROC CCC Trial.
6. The UTSW/BioTel EMS Medical Direction Team now advises all EMS agencies to adopt the CCC CPR method for **adult** cardiac arrest patients at least 8 years of age prior to advanced airway placement.
  - a. This recommendation anticipates possible changes to the American Heart Association (AHA) CPR and Emergency Cardiac Care (ECC) Guidelines.

### What DOES Change? (Refer to the Summary Table on Page 3)

1. **CHEST COMPRESSIONS:** CPR for **adult** patients at least 8 years of age in cardiac arrest will now be performed using the continuous, uninterrupted CCC method:
  - a. CCC changes the **RATIO** of compressions to ventilations, and it removes the brief pauses in compressions to deliver ventilations.
2. **VENTILATION: ONE** gentle, one-handed, ventilation is delivered every 6 to 8 seconds, allowing 2 seconds per ventilation -- do not pause chest compressions to deliver the ventilation and do not attempt coordination with chest compressions.
3. *This is the same method used for cardiac arrest patients with an advanced airway. It shall now be used for **adult** patients BEFORE advanced airway placement, as well.*

### What Does NOT Change? (Refer to the Summary Table on Page 3)

1. **CHEST COMPRESSION RATE:** CCC does NOT change chest compression **RATE!**
  - a. Chest compressions should be performed at a rate of 100 to 120 compressions per minute, the “sweet spot” that correlates best with good patient outcome.
  - b. Metronomes are the standard of care and should be used whenever possible.
2. **CHEST COMPRESSION PAUSES:** Chest compressions for **adult** patients should be paused briefly during cardiac arrest resuscitation for **ONLY TWO** reasons:
  - a. Every 2 minutes, for no more than 10 seconds, to check the rhythm (with either an AED or a manual monitor-defibrillator).
  - b. After AED/defibrillator charge for a shockable rhythm, before shock delivery, for no more than 4 to 5 seconds (“Pre-shock pause”). Immediately resume chest compressions after shock delivery, without checking a rhythm or pulse.
3. **CHEST COMPRESSION DEPTH:** No change
  - a. Adult (at least 8 years of age): At least 2 inches – allow complete recoil!
4. **VENTILATION RATE:** Adult CPR ventilation rate remains **ONLY** 8 to 10 per minute:
  - a. **IMPORTANT: Avoid excessive rate and depth of assisted ventilation!**
  - b. **Advanced Airway placement (Supraglottic Airway or ET Tube) should not be attempted until at least 6 minutes (3 cycles of CPR) have been performed, unless necessary for airway protection due to regurgitation.**
5. **SCENE TIME:** Remain on-scene for at least 10 minutes, *preferably 20*, unless patient achieves Return of Spontaneous Circulation (ROSC), scene is unsafe, or traumatic arrest. Early transport for cardiac arrest diminishes chance of good patient outcome.
6. **PEDIATRIC CPR:** CPR for infants/children under 8 years of age does **NOT** change at this time:
  - a. **The two-rescuer CPR ratio remains 15-to-2 compressions-to-ventilations, coordinated with brief pauses in compressions to deliver ventilations.**
  - b. Chest compressions **pauses**: for no more than 10 seconds every 2 minutes (to check rhythm) and immediately prior to shock delivery (“Pre-shock pause”); this is the same as adults. Immediately resume chest compressions after rhythm check/shock delivery.
  - c. Chest compression **rate** remains 100 to 120 per minute for all ages – use a metronome!
  - d. Child (1 to 8 years of age, carotid pulse check):
    - i. Chest compression method: 1 or 2 hands on the lower half of the sternum.
    - ii. Chest compression depth: Approximately 2 inches ( $\frac{1}{3}$  to  $\frac{1}{2}$  the chest depth)
  - e. Infant (less than 1 year of age, brachial pulse check):
    - i. Chest compression method: “2 thumbs-encircling hands”; thumbs side-by-side, just below the nipple line; fingers adjacent to spine; infant must be on a hard surface.
    - ii. Chest compression depth: Approximately 1.5 inches ( $\frac{1}{3}$  to  $\frac{1}{2}$  the chest depth)
  - f. AED/Defibrillator – Manual monitor/defibrillator preferred:
    - i. Child: Use AED with pediatric pads until manual monitor/defibrillator is available; may use Adult AED pads, if pediatric AED pads are unavailable.
    - ii. Infant: perform high-quality CPR until manual monitor/defibrillator is available, unless agency carries special pediatric AED pads.

## Summary of CPR Procedures for 2 Rescuers (new content is **bold & red**):

<b>Compression-to-Ventilation Ratio</b> (Use a metronome*, when possible, to time chest compressions & ventilations)		
	No Advanced Airway	Advanced Airway in Place
<b>Adult</b> (at least 8 years of age)	<b>Continuous Chest Compressions at 100 to 120 per minute, with one, single, gentle, independent ventilation every 6 to 8 seconds, without pausing compressions (deliver each ventilation over 2 seconds)</b> <b>(8 to 10 ventilations per minute)</b>  Carotid pulse check	Continuous Chest Compressions at 100 to 120 per minute; with one, single, gentle, independent ventilation every 6 to 8 seconds, <i>without pausing compressions (deliver each ventilation over 2 seconds)</i> (8 to 10 ventilations per minute)  (6 ventilations per minute for traumatic cardiac arrest)  Carotid pulse check
<b>Child</b> (1 to 8 years of age)	15-to-2 (pause compressions for ventilations)  Carotid pulse check	
<b>Infant</b> (less than 1 year of age)	15-to-2 (pause compressions for ventilations)  Important: "2 thumbs-encircling hands" chest compressions on firm surface  Brachial pulse check	

\*Metronome may be built-in to the AED/defibrillator, standalone or on a mobile communication device.

### Resources:

1. [UTSW/BioTel EMS Guidelines for Therapy](#), especially these sections:
  - a. Adult Treatment Overview (pages 9-12)
  - b. Pediatric Treatment Overview (pages 13-16)
  - c. Asystole/PEA (pages 22-24)
  - d. Cardiac Arrest (pages 30-32)
  - e. Ventricular Fibrillation & Pulseless Ventricular Tachycardia (pages 66-68)
2. [UTSW/BioTel EMS System CCC CPR TB 15-005 \(June 1, 2015\)](#)
  - a. [CCC CPR Hands-On Demonstration Video](#)
  - b. [CCC CPR PowerPoint Presentation](#)
  - c. [CCC CPR Narrated PowerPoint Presentation](#)

➤ **UTSW/BioTel EMS Providers may contact BioTel at any time with questions or concerns about this Training Bulletin, its content or the CPR changes.**