

# UTSW/BioTel EMS System Training Bulletin

## June 1, 2015

### **EMS TB 15-005**

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

# Purpose

- To set forth updated **ADULT** CPR practice guidelines, changing from 30-to-2 CPR to CCC CPR
- Effective date: June 1, 2015
- Secondary objective: to review “best practices” CPR technique for all age groups

# Definitions

- **30-to-2:** Synchronized ratio of 30 chest compressions to 2 ventilations, **pausing** compressions briefly to deliver ventilations
- **CCC:** Uninterrupted, continuous chest compressions, with independent ventilations delivered **without pausing** chest compressions
- **Adult:** For CPR and Basic Life Support, patients at least **8** years of age

# Background (1)

- Excellent CPR is the #1 factor for good patient outcome after out-of-hospital cardiac arrest
- Current UTSW/BioTel EMS System CPR is **30-to-2** for adult patients at least 8 years of age:
  - Chest compressions **are** paused to deliver ventilations
- Accumulating scientific evidence suggests an alternative CPR method is at least as effective and easier to perform properly

# Background (2)

- Alternative method is CCC (Continuous Chest Compressions):
  - Chest compressions are **not** paused for ventilations
  - Ventilations are independent, without coordination with chest compressions
  - The chest compressor and the rescuer delivering ventilations work independently, both before and after advanced airway placement

# Background (3)

- Several UTSW/BioTel EMS agencies and other North American EMS agencies have been using CCC for adult CPR for a few years, with excellent results:
  - Some have been participating in the Resuscitation Outcomes Consortium (ROC) federally-funded clinical study, the “CCC Trial”, which has recently ended
- UTSW/BioTel EMS Medical Direction Team now advises all member agencies to adopt the CCC CPR method for adult cardiac arrest patients at least 8 years of age:
  - This advice anticipates possible AHA CPR Guidelines changes

# What Changes?

## Chest Compressions:

- Chest compressions for patients at least 8 years of age are performed continuously, using the CCC method
- Chest compressions are NOT paused to deliver ventilations

# What Changes?

## Ventilation:

- ONE, single, gentle, one-handed ventilation is delivered over 2 seconds, every 6 to 8 seconds
- The rescuer delivering ventilations does so independently, **without** coordination with the chest compressions
  - No attempt should be made to “squeeze in” the ventilations between chest compressions



# What Changes?

## Summary:

- This is the same CPR method currently used for cardiac arrest patients (any age) with an advanced airway in place.
- It shall now be used for **adult** patients **BEFORE** advanced airway placement, as well.

# What Does NOT Change?

## Chest Compression Rate:

- Chest compressions should be performed at a rate of 100 to 120 per minute
  - This is the “sweet spot” that correlates best with good patient outcome
  - Metronome (built-in, standalone, or mobile device) should be used whenever possible to ensure proper chest compression rates:
    - “Too fast” is just as bad as “too slow”: it cavitates the pump and results in shallow, ineffective compressions

# What Does NOT Change?

## Chest Compression Pauses:

- With CCC, there are **only 2** reasons to **briefly** pause chest compressions during CPR:
  - Every 2 minutes, for no more than 10 seconds, to check cardiac rhythm/pulse (AED or defibrillator)
  - After AED/defibrillator charge for a shockable rhythm and before shock delivery (“pre-shock pause”)
- **Critical:** immediately resume effective CCC chest compressions as soon as possible!
  - Shorter pauses = better survival with good outcome

# What Does NOT Change?

## Chest Compression Depth:

- Adult chest compression depth is still at least 2 inches:
  - Hand position: nipple line (crease line in females)
  - **Critical:** Allow complete recoil between chest compressions!
    - Leaning on the chest prevents priming of the pump!

# What Does NOT Change?

## Ventilation Rate:

- ONLY 8 to 10 ventilations per minute:
  - Deliver 1 ventilation at a time, over 2 seconds each, every 6 to 8 seconds
  - **Critical:** Avoid excessive ventilation rate or depth
  - **Critical:** Do not attempt advanced airway (SGA or ETT) for at least 6 minutes (3 cycles of CPR), unless necessary because of regurgitation

# What Does NOT Change?

## On-Scene Time:

- Continue CPR and resuscitation on-scene for medical CPR patients for at least 10 minutes, preferably 20, before moving the patient to the ambulance
- Moving the patient early in CPR worsens outcome
- 3 exceptions:
  - Return of Spontaneous Circulation (ROSC)
  - Scene unsafe for patient and/or rescuers
  - Traumatic arrest

# What Does NOT Change?

## Pediatric (Child **and** Infant) CPR:

- Two-rescuer CPR ratio remains 15-to-2 compressions-to-ventilations
- Chest compressions are paused briefly for only 3 reasons:
  - To deliver 2 ventilations after every 15 compressions
  - Every 2 minutes, to check rhythm/pulse
  - After AED/defibrillator charge for shockable rhythm (“pre-shock pause”)
- Chest compression rate: 100 to 120 per minute
  - Use a metronome!

# What Does NOT Change?

## Child (1 to 8 years of age) CPR:

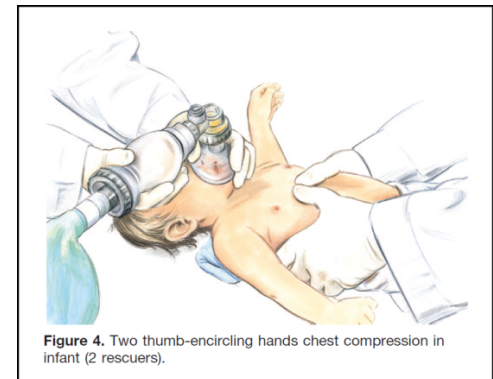
- Chest compression method:
  - 1 or 2 hands on the lower half of the sternum
- Chest compression depth:
  - Approximately 2 inches
  - $\frac{1}{3}$  to  $\frac{1}{2}$  the depth of the chest



# What Does NOT Change?

## Infant (less than 1 year of age) CPR:

- Chest compression method for 2 rescuers:
  - “Two thumbs-encircling hands” method:
    - Thumbs side by side in midline just below nipple line
    - Fingers on either side of spine
    - Infant must be on a hard surface
- Chest compression depth:
  - Approximately 1.5 inches
  - $\frac{1}{3}$  to  $\frac{1}{2}$  the depth of the chest
- Brachial pulse check, not carotid



# What Does NOT Change?

## AED/Defibrillator Use for Child and Infant:

- 1<sup>st</sup> choice: Manual monitor-defibrillator with pediatric pads:
  - 2<sup>nd</sup> choice: AED with special pediatric AED pads
  - 3<sup>rd</sup> choice: AED with adult pads (front-and-back pad placement, if needed)
- AEDs are approved for any age, but equipment issues should not delay or interrupt high-quality CPR, especially for infants:
  - Focus should be on excellent CPR until paramedics arrive with manual defibrillator & pediatric equipment

# Change Summary

**Adult (at least 8 years of age)  
No advanced airway**

**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)**

**(8 to 10 ventilations per minute)**

Carotid pulse check

# Summary of 2-Rescuer CPR

(new content is **red & bold**)

Compression-to-Ventilation Ratio (Remember to use a metronome to time chest compressions & ventilations)		
	No Advanced Airway	Advanced Airway in Place
<p><b>Adult</b> (at least 8 years of age)</p>	<p><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> (8 to 10 ventilations per minute)</p> <p>Carotid pulse check</p>	<p>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)</p> <p>(6 ventilations per minute for traumatic cardiac arrest)</p> <p>Carotid pulse check</p>
<p><b>Child</b> (1 to 8 years of age)</p>	<p>15-to-2 (pause compressions for ventilations)</p> <p>Carotid pulse check</p>	
<p><b>Infant</b> (less than 1 year of age)</p>	<p>15-to-2 (pause compressions for ventilations)</p> <p>Important: "2 thumbs-encircling hands" chest compressions on firm surface</p> <p>Brachial pulse check</p>	

# Resources

- [UTSW/BioTel EMS TB 15-005 \(June 1, 2015\)](#)
- [BioTel CCC CPR Hands-On Demo Video](#)
- [UTSW/BioTel EMS 2014-2016 Guidelines for Therapy](#)
  - Adult Treatment Overview (pages 9-12)
  - Pediatric Treatment Overview (pages 13-16)
  - Asystole/PEA (pages 22-24)
  - Cardiac Arrest (pages 30-32)
  - Ventricular Fibrillation/Pulseless Ventricular Tachycardia (pages 66-68)

# Questions or Concerns?

At any time, please feel free to:

- Contact BioTel directly
- Access the [BioTel Web Site](#)
- [Email the Medical Direction Team](#)

**THANK YOU FOR  
EVERYTHING YOU DO!**