Evidence Based Chest Compressions: Bring in the Data

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EXED138A

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Presenter Disclosures
I am a consultant for Physio-Control, Inc.

Objectives
- Discuss the use of a real-time feedback device in both training and real events to assess CPR performance
- Utilize data and CPR metrics to improve CPR performance
What is the evidence?

According to AHA 2015 BLS Guidelines, chest compressions should be:

- Rate: 100-120 compressions per minute
- Depth: 2.0-2.4 inches
- Chest compression fraction: Goal of 80%

What is chest compression fraction?

1. The percent of the depth of the victim’s chest your compress
2. The percentage of time doing compressions during a resuscitation
3. The likelihood of fracturing a rib during CPR
4. The period of time each rescuer does CPR

How do we meet those guidelines?
How do you know if you are compressing at the correct depth?

A. Feel for a pulse with compressions  
B. Use waveform capnography monitoring to evaluate CPR quality  
C. Use a feedback device  
D. I don’t know

Factors that influence depth of compressions:

- Size of rescuer
- Stamina of rescuer
- Strength of rescuer
- Chest compliance of victim

How many pounds of pressure does it take to compress 2 inches?

(Perez and Trenkamp, 2016)

How do you monitor rate of compressions?

1. Sing a song  
2. Metronome  
3. Feedback device  
4. I just know
Let’s talk about Rate

Pure adrenaline – faster is better right? NO.

>120 = Survival

120-139 – depth inadequate in 50% of cases

>140 – depth inadequate in 70% of cases

(Idris et al., 2015)

Real-time Feedback Device

• Takes away subjectivity
• Gives feedback for rate and depth in real-time
• Allows the rescuer to correct deficiencies on the spot
• Rescuer fatigue becomes more than just a “feeling”
• Identifies strengths and weakness in CPR performance
• Serves as a “CPR personal trainer”

Uses for real-time feedback device

• Life support classes - Use to monitor rate, depth and CCF
• Practice sessions – Skills degrade after 3-6 months (Sutton, Nadkarni, & Abella, 2012)
• Simulation – It is difficult to translate CPR science into practice in a stressful situation (Soar et al., 2010)
• Resuscitations – Real-time feedback in a real situation
Pilot Project

- 25 Acute care and Oncology nurses.
- Used feedback device on a manikin for 2 minutes of CPR – metronome off and unable to see the feedback
- 10+ minute rest period while educated on the device (1 on 1)
- Repeated CPR with real-time feedback on a manikin
- Followed up in 2-4 weeks for 2 more sessions (total of 4 rounds of CPR)
- Collected data on rate and depth of compressions without and with feedback
- 20 completed all 4 rounds

Is everyone competent to do CPR?

Discoveries....

- Nurses with smaller stature had a more difficult time achieving adequate depth (all participants used a step stool)
- 1 nurse of the 20 who finished the pilot never reached 2.0 inches of depth, even with the feedback device.
- Some nurses performed better in the beginning of their shift rather than at the end of their shift
Discoveries....

- Some nurses complained that it was more difficult to perform CPR immediately after a meal, and it reflected in their performance.
- Nurses were very competitive with themselves. They wanted to improve their performance each time.
- Feedback device allowed us to objectively identify staff who were well suited to perform compressions, and those who would be better in other roles.

References


