



Emergency Medical Services

Partners

September 2010, Volume 2

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Compressions

Studies continue to demonstrate that the most important factors in cardiac arrest survival are early CPR and early defibrillation.



- ◆ CPR should be “Hard, fast and deep.” Depth is “1.5” to “2” for adults. The rate is 100 compressions per minute.
- ◆ Keep hands on chest, allow full recoil.
- ◆ Minimize interruptions to less than 10 seconds. When compressions stop the blood pressure drops to zero. Keep blood flowing.
- ◆ Switch compressors every two minutes to minimize fatigue and insure quality compressions. Seek seamless transitions between compressors.
- ◆ Compress when charging. Resume compressions immediately after shock.
- ◆ Intubation should be delayed until at least three rounds off compressions have been done. Try to avoid stopping compressions during intubation or consider placing a quicker airway such as an LMA or Combi-tube.
- ◆ Compression to breathing ratio is 30:2 if there is no advanced airway in place. With an airway (ET, Combi-tube, King LT or LMA), compressions should be continuous.
- ◆ Do not hyperventilate the patient. A patient in arrest should receive 8-10 ventilations per minute. Ventilate only enough to produce chest rise (400-600 ml). Too much positive pressure ventilation inhibits blood return to the heart. Each rescue breathe should be given over one second.

ET Interruptions

The November 2009 issue of the *Annals of Emergency Medicine* has a study called [*Interruptions in Cardiopulmonary Resuscitation from Paramedic Endotracheal Intubation*](#).

With the latest science showing the benefits of uninterrupted cardiac compressions, the investigators asked the question: Since nearly every out-of-hospital cardiac arrest patient gets an intubation attempt, how do intubation attempts affect the CPR?

Using a prospective observational study design, they looked at two Pittsburgh EMS Agencies, an urban service with fourteen two-medical ambulances doing 65,000 calls per year and a county rural based agency with 27 single paramedic ambulances doing 60,000 calls per year. Both were top flight, well-trained services with strong involved medical direction.

The investigators used cardiac monitors that continuously recorded ECG rhythm, ventilations, ET_{CO}2, and chest compressions. They were also equipped with audio recorders. All CPR interruptions of 5 seconds or more were identified. The interruptions were not just ET attempts, but also tube confirmations, adjustments, securing the tube, etc. They combined digital information with audio to determine what was going on.

The investigators found a median of 2 CPR interruptions per cardiac arrest with a range from 1-9 interruptions. The median duration of the first ET attempt was 45 seconds (range from 7 to 221 seconds). In 30% of cases the 1st ET attempt exceeded one minute; some cases had interruptions lasting 4 minutes.

The median total CPR interruptions were 109.5 seconds per patient. 25% of patients had more than 3 minutes of interruptions, some cases had 7 minutes of interruptions.

The bottom line: paramedic out-of-hospital endotracheal intubation efforts were associated with multiple and prolonged CPR interruptions.

In an accompanying editorial, [*Do Not Pardon the Interruptions*](#), the authors made the following points:

Continued on Page 2...

1. Many aspects of current out-of-hospital cardiac arrest management lead to detrimental loss of circulation during CPR.
2. Interruption intervals, although significant, actually underestimate, the amount of time that circulation is compromised because of the "ramp-up" period required to restore adequate circulation on resumption of compressions.
3. There is no evidence that tracheal intubation contributes to survival in out-of-hospital cardiac arrest.

Their conclusion:

"For at least the first 5 to 10 minutes of resuscitation providers should prevent interruptions of chest compressions for anything other than single defibrillatory attempts and intentionally delay tracheal intubation before return of spontaneous circulation."

Some services in the country now forbid their medics to intubate v-fib arrests in the first ten minutes or more of resuscitation.

Some are arguing the medics should simply forgo ET intubation altogether for the immediate insertion of a supraglottic airway.

While the North Central EMS Region allows paramedics to use their discretion when to intubate, paramedics should weigh the need for an advanced airway versus the critical need for quality and continuous compressions.

The new 2010 AHA Guidelines due to be published in October 2010 will likely offer more guidance on this issue. Stay tuned.

September CME

Please join us for our September CME on Thursday, September 2, 2010 at 9:00 A.M. The topics are:

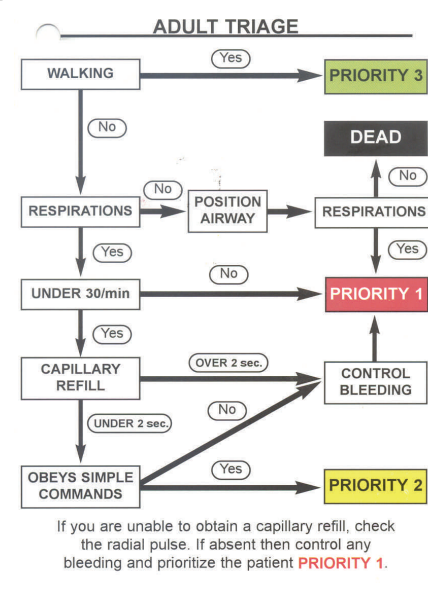
- ◆ **Asthma** – Presentation by Dr. Mathew Ledford.
- ◆ **Hands only CPR:** Review of two articles from the July 2010 *New England Journal of Medicine*: "Compression-Only CPR or Standard CPR in Out-of-Hospital Cardiac Arrest," and "CPR with Chest Compression Alone or With Rescue Breathing."
- ◆ **ECG Leads** - How to place electrodes and monitor leads to best help your patient. Discussion of proper lead placement, as well as advanced leads to best view bundle branches, atrial fibrillation, the right ventricle and posterior heart.
- ◆ **Case Reviews** – review of several recent EMS cases brought to the Health Center.

All providers are welcome. Meetings are held on the first Thursday of each month in the ground level conference room of the ASB Building (Administrative Resources Building) located by the helipad. 3 hours CME is given. 4 if assigned articles are read. For questions about CME or to obtain a copy of journal articles, send an email to Peter Canning at canning@uchc.edu or a call (860) 679-3485.

Free parking is available in the lower lot of the Medical Arts & Research Building (MARB) next to the ASB: There are two levels of parking at the MARB. Both levels have general, convenience and patient parking. Please be attentive to the posted signs.

SMART Triage

SMART triage is the official triage program in the state of Connecticut. All responders should regularly familiarize themselves with the SMART triage kits in their response vehicle. Be prepared.



Heart Block/STEMI

When Paramedic Brian Brown of **Granby Ambulance** responded to a call for syncope, he found the patient alert, but weak with cool, clammy skin. He quickly discovered the patient's heart was beating unacceptably slow. En route to John Dempsey Hospital, after trying atropine with only brief success, Brown watched the patient's pulse plummet into the 20's. He attached his external pacer to the patient's chest and was able to successfully pace the patient at a rate of 70 using 60 milliamps of electricity. When he arrived at the ED, the patient was kept on Granby's pacer while the ED team, prepared the patient for urgent transport to the cardiac cath lab where Chief of Cardiology Michael Azrin successfully removed the critical blockage from the patient's heart and inserted a temporary pacemaker. ED staff were effusive in their praise for Brown's life-saving actions. Brown offered his own praise for the teamwork and quickness of the hospital's response that saw the patient rushed to the cath lab. The result of the EMS/ED/Hospital teamwork: the patient was released from the hospital two days later. An echocardiogram showed the patient's right and left ventricles's normal function had been preserved. Outstanding job!

CONTACT US:

Any questions or suggestions about EMS? Looking for patient follow-up?



Contact EMS Coordinator Peter Canning at canning@uchc.edu or call (860) 679-3485.