

MODULE 3





First Responders:



Your Role in Resuscitation

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Objectives:


- Discuss the first responders role in a resuscitation of a cardiac arrest patient
- Review the “team approach” to resuscitation
- Discuss the importance of High Quality CPR



Understanding how CPR works:

- Maximizes cerebral and coronary perfusion pressures
 - Forces oxygenated blood to these two areas
- Boosts myocardial responsiveness
 - Improves chances of return of spontaneous circulation, sometimes referred to as ROSC
 - (Ornato, 2006)

Three things to look at when reviewing this study

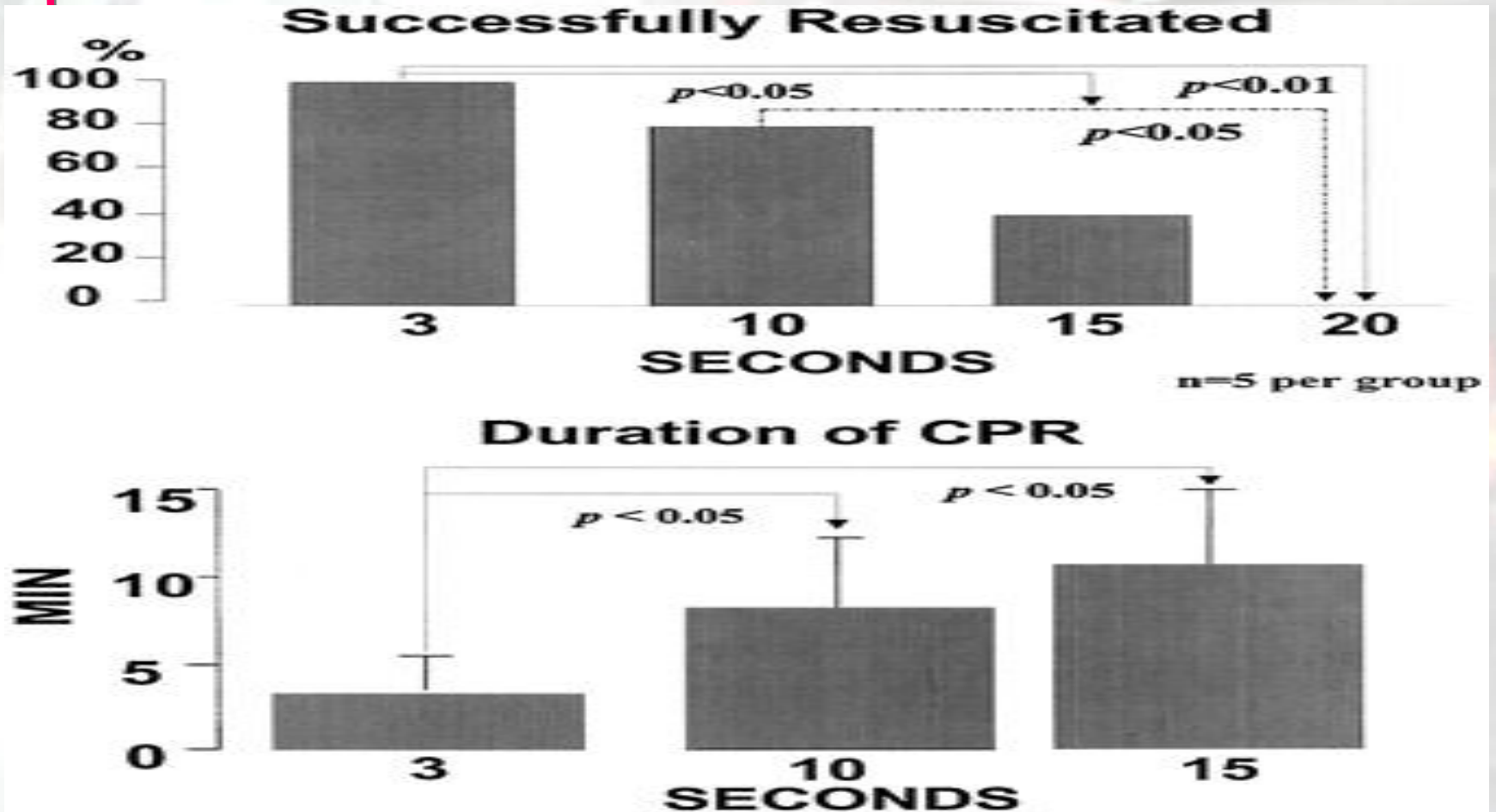


“Research: The effects of Hands-Off Interval”:

- Swine study – 20 animals
- VF was induced
- 7 minutes of no treatment; CPR after 1st shock
- Randomized to 4 groups of hands-off interval:
 - 3 seconds
 - 10 seconds
 - 15 seconds
 - 20 seconds

Compressions:

LIMIT HANDS OFF
INTERVALS



Compressions:

**RATE MATTERS
PUSH FAST**



Coronary Perfusion Pressure in Cardiac Arrest:

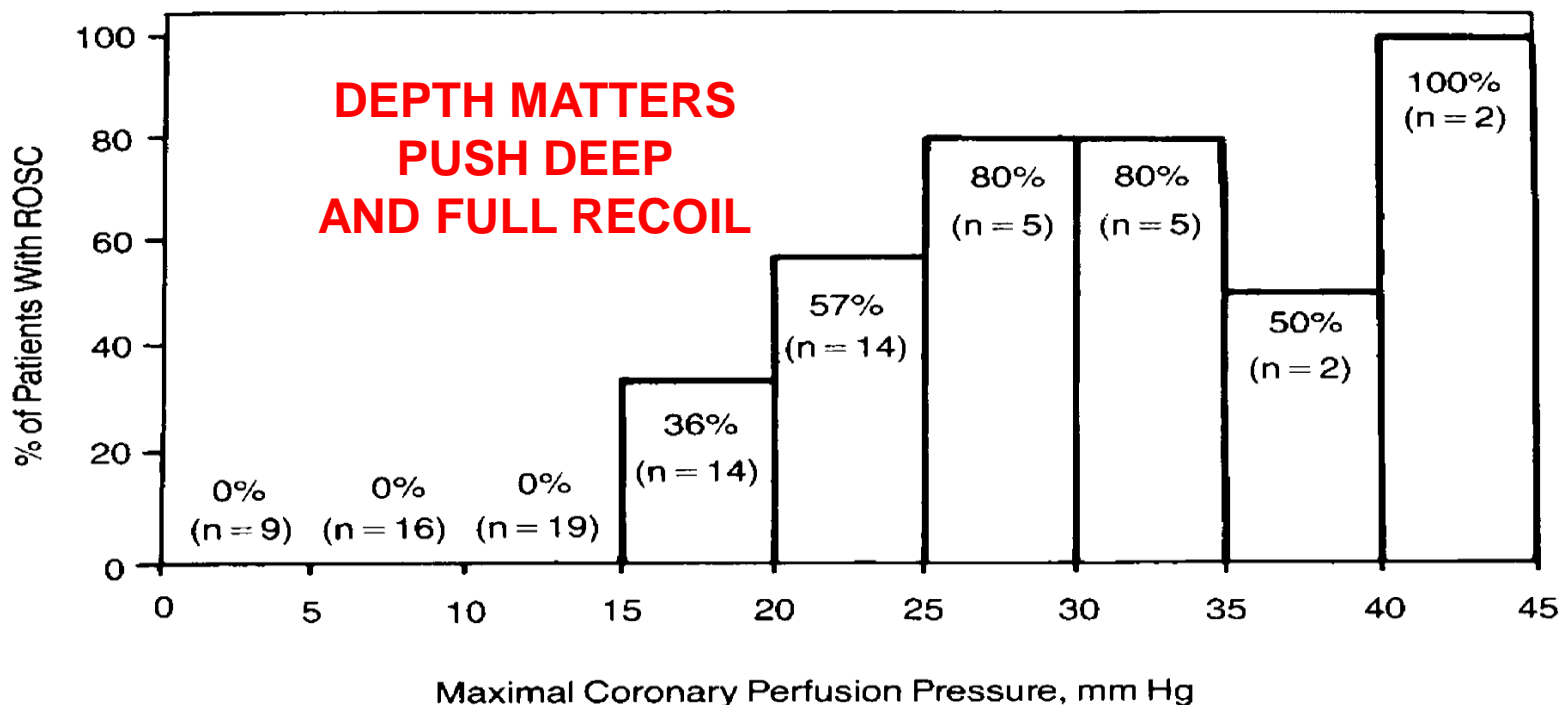


Fig 5.—Percentage of patients with return of spontaneous circulation (ROSC) as a function of the maximal coronary perfusion pressure.



First Responders Managing a Cardiac Arrest:

- High Quality CPR
 - Compression only vs traditional compressions/breathing
 - Monitor:
 - Rate, depth, recoil, time off chest, switch chest compressors every 2 minutes to avoid fatigue
- AED
 - Quick application
 - Consider compressions while charging
 - Quick initiation of compressions after shock or if none recommended.



First Responder Role:

CONTINUOUS COMPRESSIONS

- Compressions continue to be at a rate of at least 100 per minute
- **There will be no ventilation pauses.**
- **“Do NOT interrupt chest compressions”** during the CPR cycle.
- If possible, change the Compression Person each 2 minute cycle when the AED analyzes the rhythm.



First Responder Role:

EFFECTIVE COMPRESSIONS

- Aggressively maintain compression depth of 2 inches for adults (**or 1/3 depth of chest**).
- Compressions should be smooth with 50% down / 50% up motion.
- Completely release pressure with each compression for maximum blood flow.
- Do Not bounce off chest.



Automated External Defibrillator (AED) Use:

- *****“Turn on the AED as soon as cardiac arrest has been verified”*****
- **“Do NOT interrupt chest compressions”** to cut clothes or place the AED pads.

INTERPOSED VENTILATIONS

- **“Do NOT interrupt chest compressions”**; (1) ventilation for every 10 compressions.
- Ventilate ‘just enough for chest rise’.



AED:

- The Designated Ventilation Person may count compressions silently to keep track or the Compression person can count.
- **Vocalize “Bag” or “Ventilate” out loud.**
 - This will yield a ventilation rate of **approximately 10 per minute.**
- The Compression Ventilation Ratio of 10:1 applies to pediatric patients as well.



AED:

- PULSE CHECKS
- NO PULSE CHECKS AFTER SHOCK
- Check Pulse only after No Shock Advised. If no pulse, immediately begin 2 minutes of CPR – no need to wait for prompts.
- Continue to monitor the effectiveness of Chest Compressions during CPR



Human Observational Study:

- Using defibrillator data, the hands-off interval was measured
- Predictive model based on fibrillation characteristic provided 3 statistical groups:
 - 0-25% prob of ROSC
 - 25-40% prob of ROSC
 - 40-100% prob of ROSC



Results: Time delay in compressions waiting for AED

- Pre-shock pause <10 seconds was considered ideal. Compared to that:
 - Pause 10-20 seconds = 26% decrease in survival
 - >20 seconds = 52% decrease in survival
- Post-shock pause <10 seconds was considered ideal. Compared to that
 - Pause 10-20 seconds = 3% decrease
 - >20 seconds = 17% decrease



The Future of CPR:

- Continuous CPR Training
- Compressions while AED charging
 - If AED does not charge in 10 seconds or less
- Technology for Q/A of arrest
- Pre assignments “Pit Crew Approach”
- Stop watches stay on track, change compressor, medicine administration
- Practice makes perfect so practice, a lot.



The future of AED's:

- Audio Information is key.
 - This must be discussed with personnel
- Stay focused.
- Download all AED data and review it
 - Review all of your cardiac arrest downloads with everyone on scene
- Make sure that everyone understands how effective their CPR was



Example of AED voice recorder:

- Confirm cardiac arrest – turn on AED
- Do CPR while putting on AED
- State “company” and “2 mins CPR” or “have done xx secs CPR”
 - If using an AED with audio recording
- Do 2 mins CPR before 1st rhythm analysis
 - Unless AED stops you with a voice command
- Give ventilations rate 10:1 without interrupting compressions



AED Continued:

- **SHOCK** if indicated – immediately start 2 mins CPR
- If **NO SHOCK** - check pulse (< 10secs) – immediately start 2 mins CPR
 - Do not analyze again - Only stop CPR every 2 minutes to ck pulses (< 10 secs)
- State “Medics on scene”
- Time 2 min CPR intervals for Medics
- Count down for Medics last 10 secs of 2 min CPR interval



Durham Fire Cardiac Arrest Drill:

- Four personnel Engine/Ladder company:
 - Firefighter one checks for a pulse and starts compressions, also presses the shock button on the D-fib when needed
 - Firefighter two manages and secures airway
 - Captain makes assignments at the start of shift, connects D-fib and begins documentation on scene
 - Driver will help with additional equipment also sets up cooling protocol (**Why bother with that? That's EMS Job**)
 - Family member or bystander may be considered to assist with ventilations once the airway is secured



Durham Fire Cardiac Arrest Drill:

- Three personnel Engine/Ladder company:
 - Firefighter one check for a pulse and starts compressions, also presses the shock button when needed
 - Captain connects D-fib and manages and secures airway
 - Driver relieves Captain from the airway
 - Family member or bystander **may be considered to assist with ventilations once the airway is secured**
 - Captain starts with documentation or helps if needed with cooling protocol(SC)



Durham Fire Cardiac Arrest Drill:

- Squad units or Two personnel companies:
 - Firefighter one checks for a pulse and starts compressions, also presses the shock button when needed
 - Technician connects D-fib and manages and secures airway
 - Family member or bystander **may be considered** to assist with ventilations once the airway is secured (TK)
 - — After EMS or additional help arrives Technician may start other patient care or documentation, if sufficient help is on scene



Quality Improvement (QI):

- Response Times:
 - The time required from receipt of the 911 call through patient final outcome
 - Dispatch, en route, and scene arrival
 - All components of the response time should be reviewed
 - A plan to decrease delays should be developed and tested
 - Team Approach to include data sharing and feedback with all components of the system: Dispatch, First Responders, EMS, and hospitals
 - Use the Cardiac Arrest Registry to Enhance Survival
 - Web address: Mycares.net

CPR Demonstration:





Summary:

- First Responders
 - Have a key role in the survival of cardiac arrest patients
- High Quality CPR
 - Must be done continuously and effectively if patients are to survive
- AED
 - Applied as soon as cardiac arrest is verified
 - Do not stop compressions to apply