Pulse Check - 2013

Choreography of the Code (Chaos of the Code)

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Disclosure

There is no financial or business relationship with any manufacturing or marketing entity for any product referenced in this presentation .

I hold credentials as an AHA instructor in BLS, ACLS, and PALS. In addition, serve as Regional Faculty for PALS.

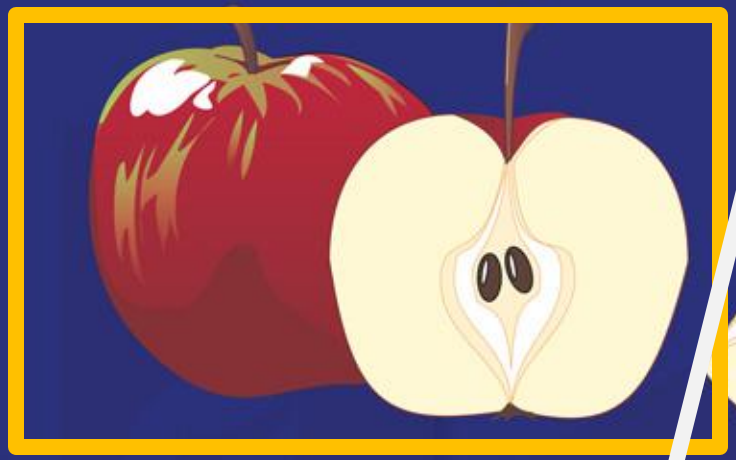
Objective

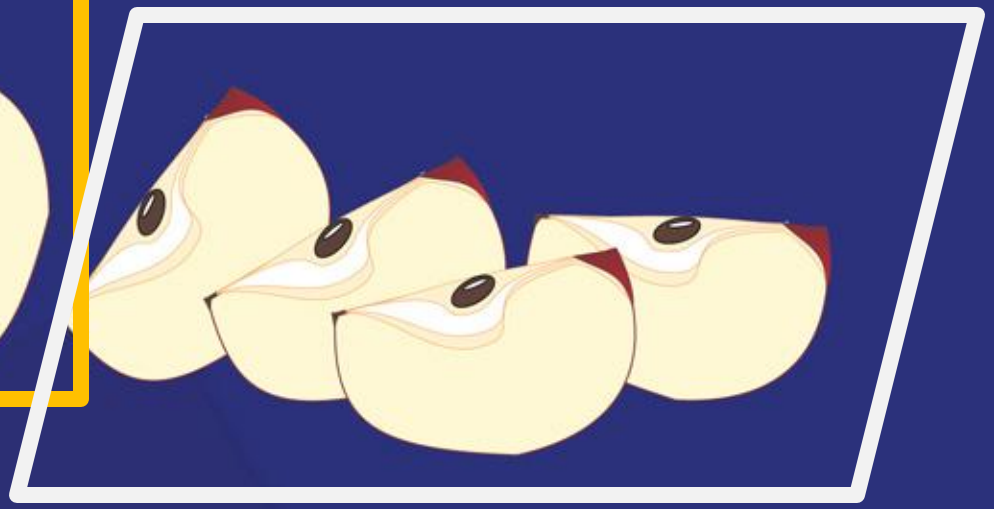
1. Understand effective management of a cardiac arrest.
2. Describe how running a code should involve incident command.
3. Identify the responsibilities of code participants.
4. Recognize the importance of doing QI review on all codes.

The Issues

- Leadership
- Communicating
- Multitasking
- Medicine of Resuscitation
- Time

How thin to slice the apple?





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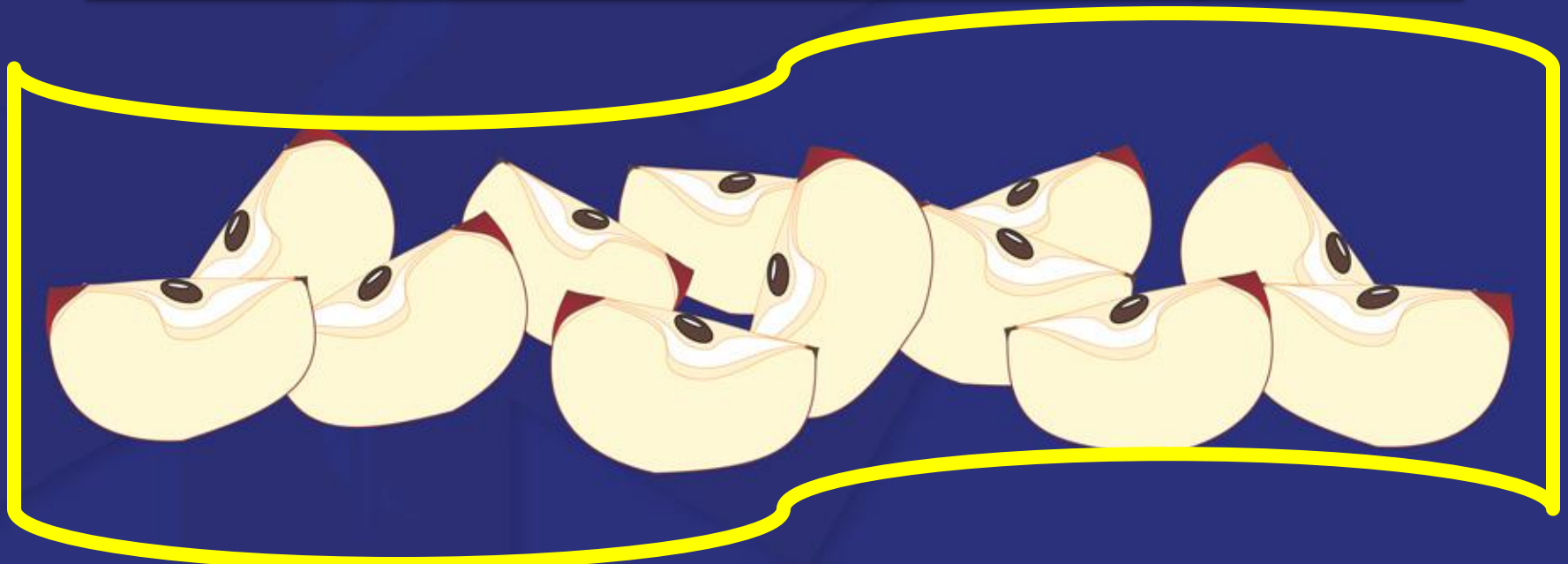
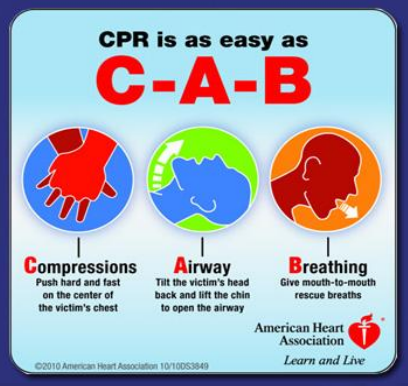


Clinical Stuff

Not so much today . . .

BUT the 2010 standards contain some real important stuff…



- CAB
- Compressions
- Cricoid pressure

Guidelines for Resuscitation

- New York State Protocols (BLS)
- Regional Protocols (ALS)
- American Heart Association Standards
  (It is a brave new world!)

Team Dynamics

American Heart Association®
Learn and Live

1) Team Leader
2) Team Member
3) Mutual Respect
4) Clear Roles & Responsibilities
5) Clear Message
6) Closed – Loop Communications
7) Knowledge Limitations
8) Knowledge Sharing
9) Constructive Intervention
10) Reevaluation & Summarizing

Case #1

- A 3:00 AM dispatch to a private residence for a person who has fallen in the bathroom and is reportedly unresponsive. No other information is available.
  - **How do you plan for this call during the 5 minute response?**

Case #1 (cont'd.)

- Upon arrival you find a 73 yo ♂ on the floor in front of a toilet in a small bathroom. The patient responds only to painful stimuli.
  - **What is the 1st concern for this patient?**
  - **What actions should be taken?**
  - **How you prepare for a resuscitation?**

Case #1 (cont'd.)

- A short time later the patient goes into cardiopulmonary arrest.
  - What needs to be done?
    - Medically
    - Logistically

What Makes a Difference?

- Leadership (Keeping it organized)
  - With a mix of critical thinking
- Compressions
  - Hard, fast, and deep
  - Minimal interruptions (< 10 seconds)

(ALS can wait)

What Makes a Difference?

- **NO INTERUPTIONS for compressions:**
- What helps to keep compressing:
  - Pads being placed for defibrillation
  - Changes for persons doing compressions
  - Use of manual device for compressions
  - Endotracheal intubation

THE CLOCK IS ALWAYS TICKING

Organization - - - 43 person squamish
Is this the model you want to follow?

A Squamish team consists of 43 players: the left & right Inside Grouches, the left & right Outside Grouches, four Deep Brooders, four Shallow Brooders, five Wicket Men, three Offensive Niblings, four Quarter-Frummerts, two Half-Frummerts, one Full-Frummert, two Overblats, two Underblats, nine Back-Up Finks, two Leapers and a Dummy.

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Command & Control

In a crowd of people with a very sick patient having a cardiovascular accident, complicated by an unstable airway and only two of the seven responders (28.5%) are actively involved in care.

A.J. Heightman
Editor, JEMS
June, 2012

Command & Control

- Keep the agenda moving.
- Delegate.
- Division of Labor.
  (No task overlooked.)
- Periodic assessment.
- Make decisions.
- Control scene
  - Internal
  - Periphery

Team Leadership – Incident Command

Someone needs to be in-charge

"The difference between a FedEx truck and an ambulance is the FedEx driver knows everything going on in his truck."

Lance Becker, M.D.

Annuals of Emergency Medicine

Vol. 22 No.1 (1/93)

Team Leadership – Incident Command

- Keep track of time.
- The clock is ALWAYS ticking.
- Most code components are time dependent.

Command & Control

- Protect against tunnel vision
- Keep “ego tripping” in check
- Get patient history
- Contact Medical Control
- Transport decision

PIT CREW MODEL

What does the literature say?

Research

"Survival-to-discharge of patients with out-of-hospital cardiac arrest increased after implementation of minimal interruption cardiac resuscitation . . ."

Journal of American Medical Association
3/12/08 Vol. 299, # 10

CPR Pit Crew

Compressions

Airway

Airway

Team Leader

IV/IO Medication

AED

Family (Pt. HX)

CPR Checklist

Cardiac Arrest Team Leader Checklist

CONFIRM ARREST ON RADIO

- **Cardiac Compressions**
  - Manual → Rate (Hard, Fast, Deep – Full Recoil)
    - Rotate providers every 2 minutes
  - Thumper Deployed
- **Airway**
  - ATV Applied/ Venting Setting Correct

Minimal interruption of compressions.

Defibrillation

- Advanced Airway
  - E/T
  - CO_2 Monitoring
  - ResQPOD®

Ensure adequate supply of air/O_2 tanks.

1

START IV

- **Medication Administration**
  - Epinephrine
  - Amiodarone
  - _____

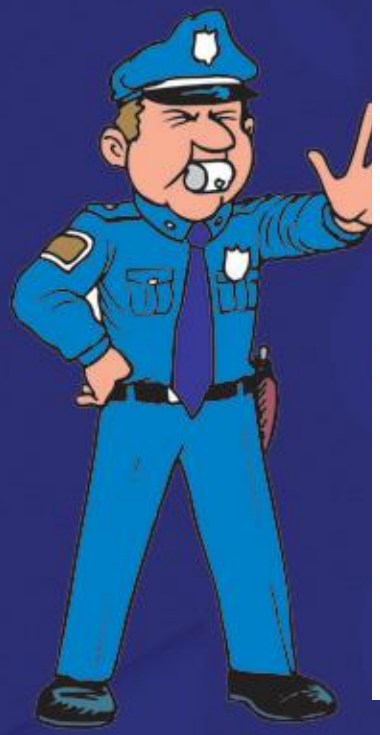
ROSC

- **Remove ResQPOD®**
- **Assess/VS/Sedate PRN**
- **Appropriate Antiarrhythmic**
- **Therapeutic Hypothermia**
- **Fluid Bolus vs. Pressor Agent**
- **12 lead & xmit**

2

4/11

The Environment



- Ideal conditions don't exist in EMS.
- Alter the environment.
  - Bigger space
  - Lighting
  - Egress from the scene
- Do you need a "traffic cop"?

Work as a team.

- Communicate.
- When in doubt ASK!
- Keep your eye on the ball. (Lots of details.)
- Safety is always a concern.

Stuff that can help the code…

1. ATV (automatic transport ventilator)

2. Mechanical Compression Device

Machines get it right and don’t get tired.

Engineering Controls

- Mechanical device that do stuff better than us.

CPR DEVICES

What does the literature say?

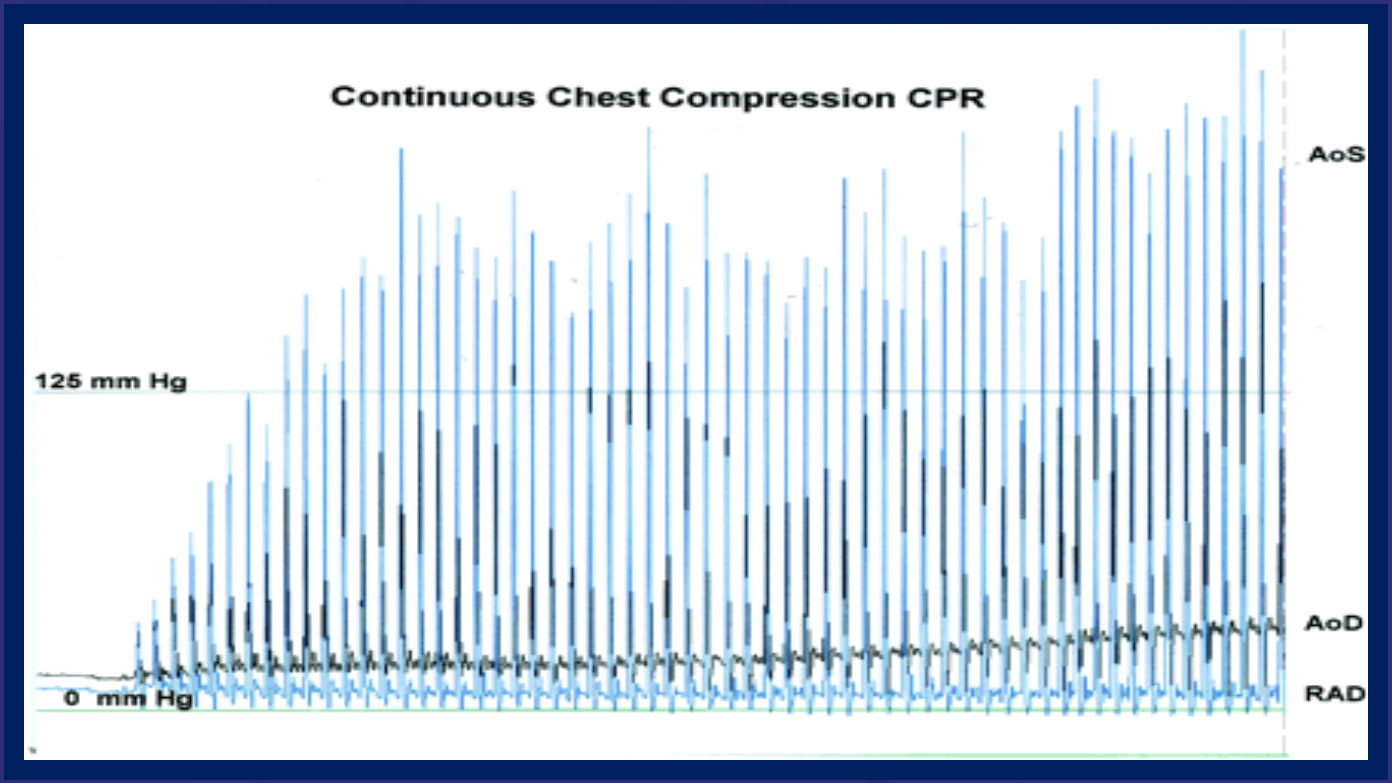
CPR Interruption

Interruptions in chest compressions to apply a LUCAS™ device can be < 20 seconds but often takes longer. Recommend better training on application technique.

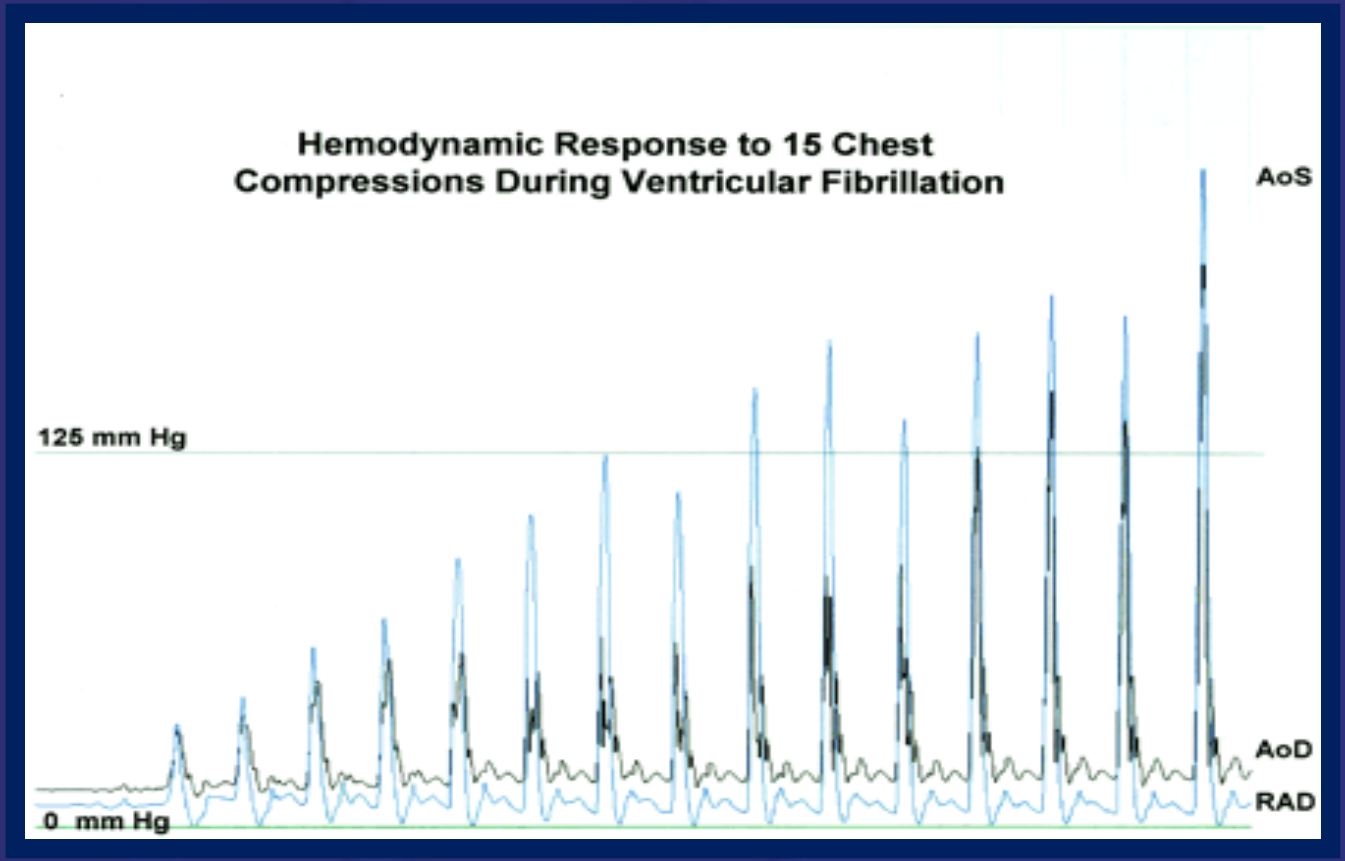
Assessment of CPR Interruption from Transthoracic impedance during use of LUCAS™.

Yost et al. Resuscitation, 8/12, 83 (8): 961-5

Continuous Chest Compressions

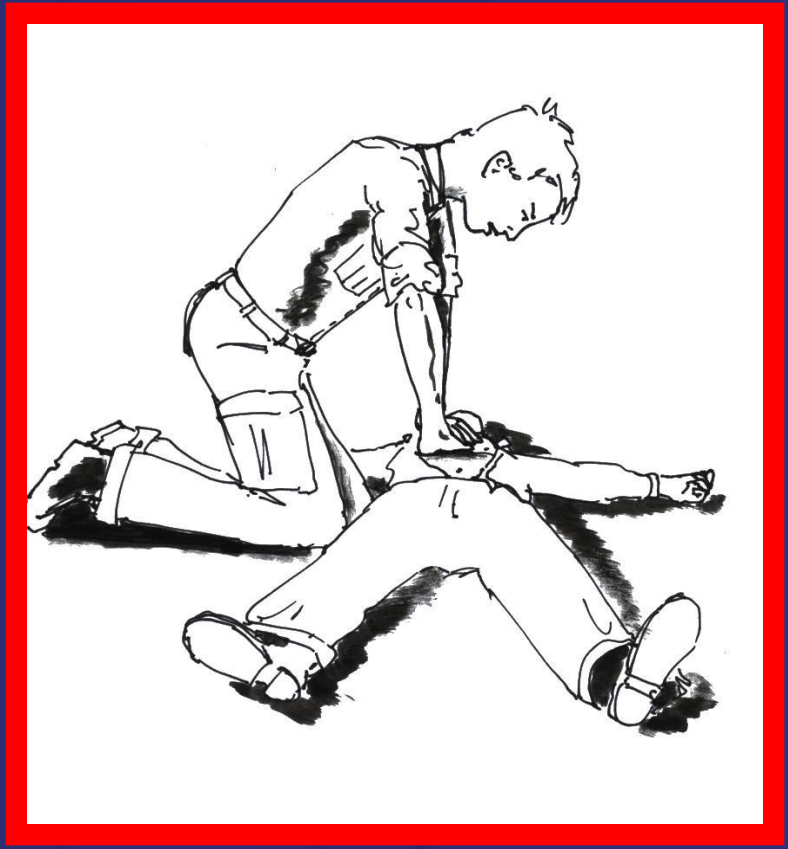


Hemodynamic Response to Compressions



EMS RESPONDERS ARE A CPR DEVICE

- Rotate every 5 cycle of 30:2 (~ 2 minutes)

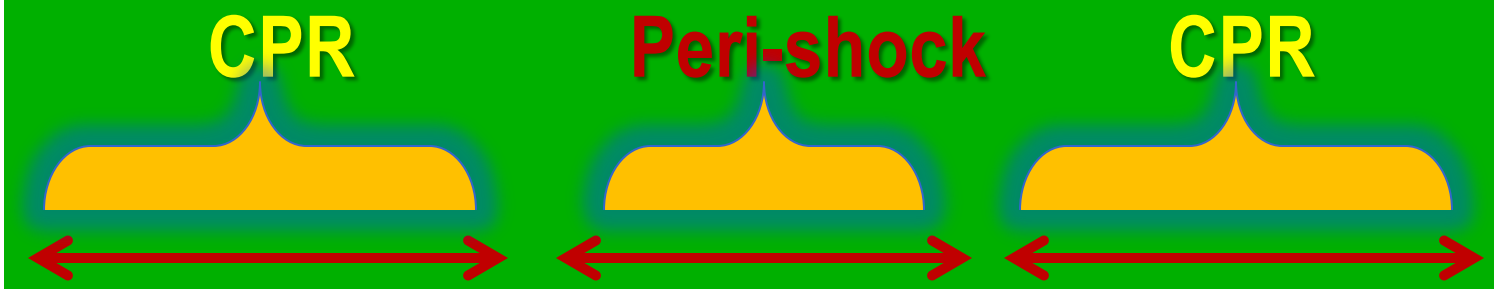


Defibrillation

- **Many AEDs will take 20 to 30 seconds to charge.**
  - **What's going on during that time?**

Literature

- In CA patients needing defibrillation the longer with longer peri-shock and pre-shock pauses were independently associated with decrease in survival to hospital discharge. (Circulation)
- Peri-shock is defined as the time for the AED to analyzing, charging, and shocking.



What does the literature say?

The clock is always ticking…

In a simulated cardiac arrest ⅔ of the teams failed to provide BLS (including defibrillation) in appropriate times.

Resuscitation
Vol. 60 Issue 1 (pp. 51-56)
January, 2004

What does the literature say?

Hyperventilation

Hyperventilation elevates intrathoracic pressure thereby decreasing venous return coronary perfusion pressure, cerebral perfusion pressure , and ultimate survival.

Hyperventilation-induced Hypotension During CPR

Aufderheide, T. et al

Circulation 2004; 109: 1960-1965

VENTILATIONS RATES

Despite seemingly adequate training, professional rescuers consistently hyperventilated patients during out-of-hospital CPR. Subsequent hemodynamic and survival studies in pigs demonstrated that excessive ventilation rates significantly decreased coronary perfusion pressures and survival rates. . .

Critical Care Medicine
Vol. 32 #9 pp S345-S351 (9/04)

Stuff that can help the code…

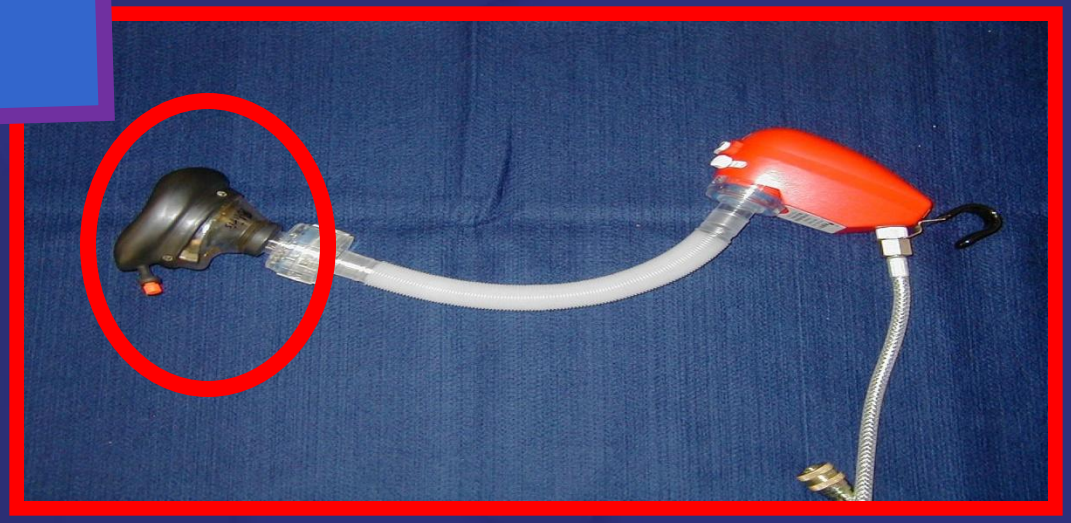
ATV (automatic transport ventilator)

It has a constant rate & volume.

What can go wrong: Mask seal.

ENGINEERING CONTROLS

Manual Control



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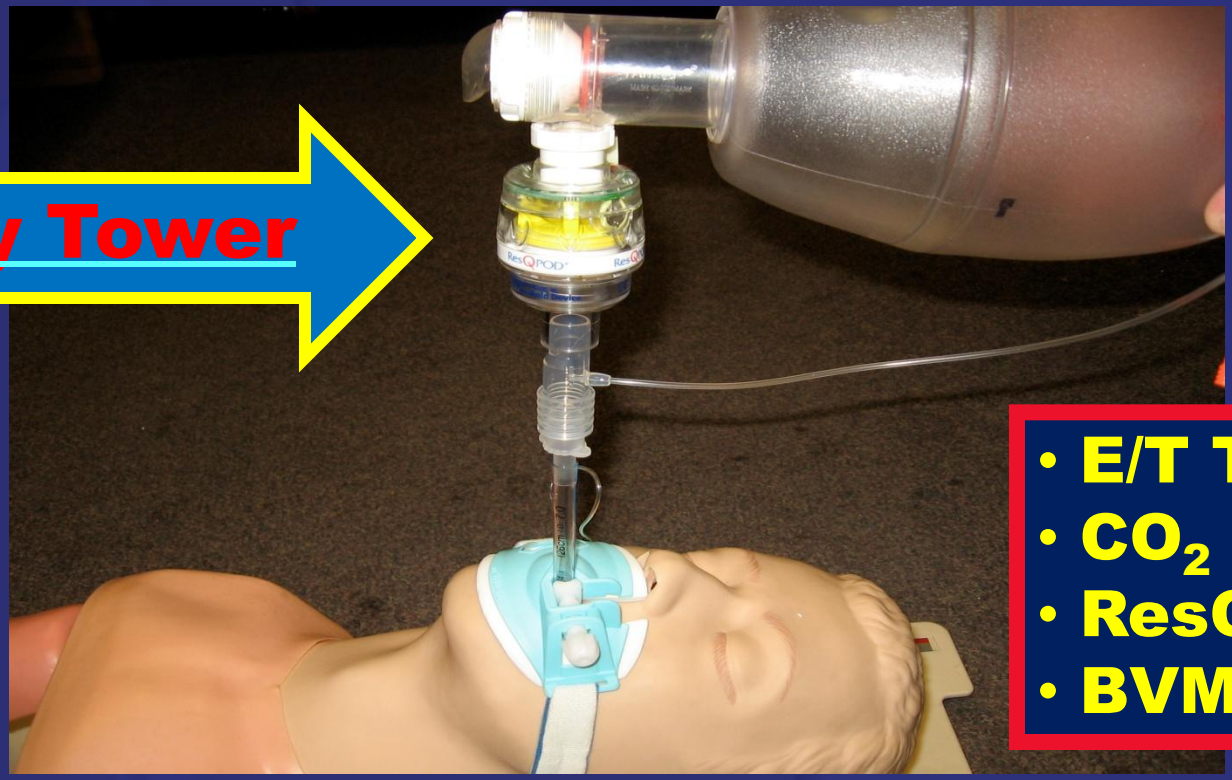


- E/T Tube
- CO_2 Detector
- ResQPod®
- BVM/ATV

Fix one…Break one!

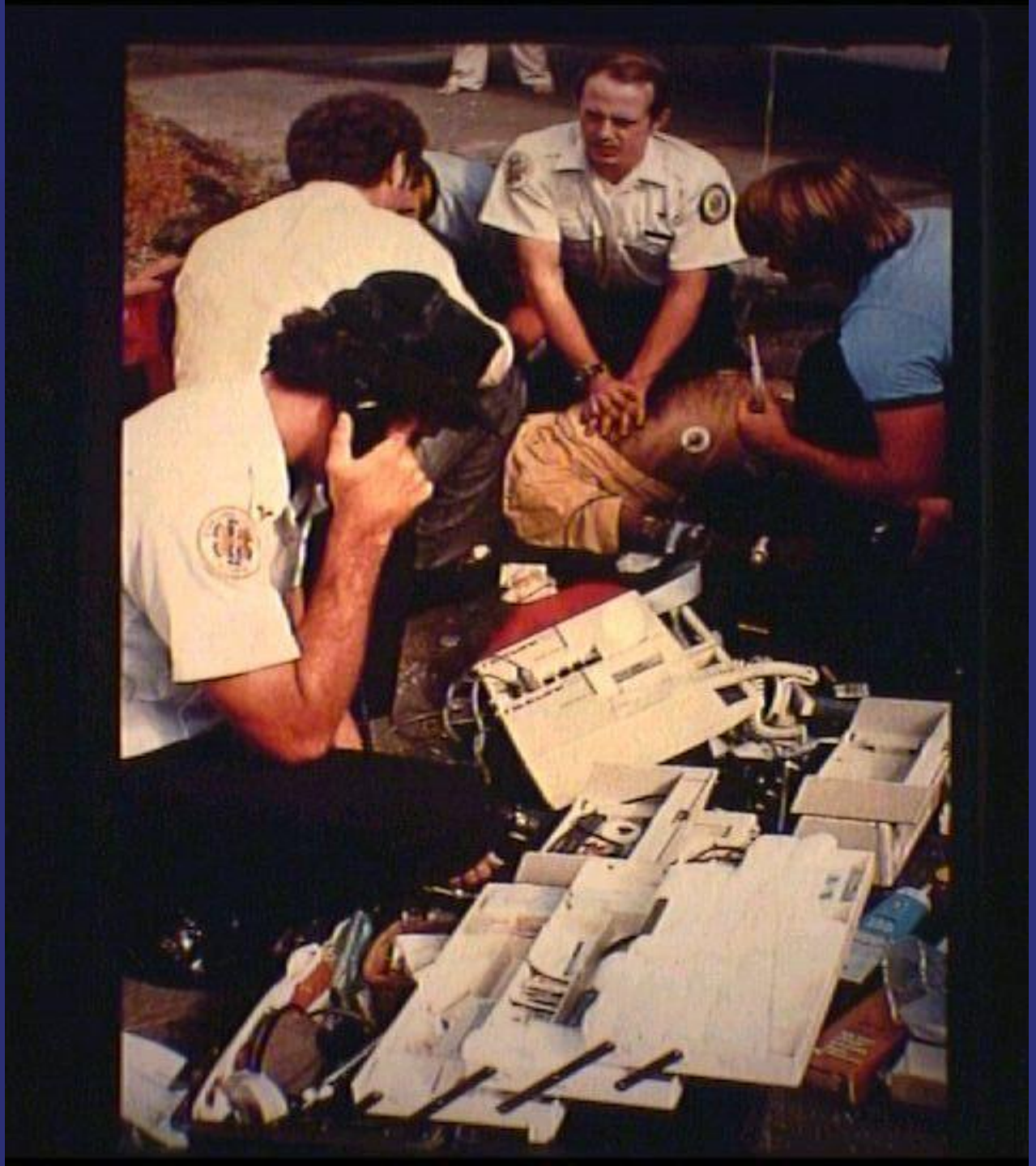
When to transport?

- Status of patient
- Resources (includes ALS)
- Proximity to hospital
- Protocols (TOR if appropriate)

Case #2

At the start of a morning shift the radio beeps and you (BLS ambulance) are dispatched to an office building for an unresponsive female. No other information is available as the call information was received form a 3rd party. When you arrive, CPR is in progress by a co-worker.

- When should EMS responders start planning for handling this resuscitation?
- Based on what you find upon arrival how should you start to stage this scene?
- When should the defibrillator be attached?



Getting Better

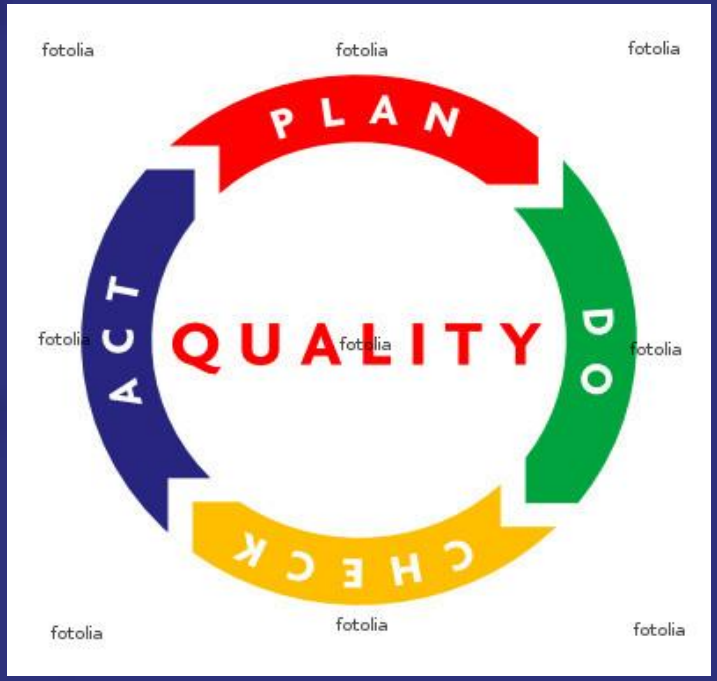
- Quality Improvement makes the process better.
- It won't happen on its own.
- Many issues that impact prehospital resuscitation are not immediately obvious and will require analysis.

Training
(Needs to be done – lots of it)

- Not only individual skills . . . but as a team
- Practice the leadership role
- Critique – then do it again

Take Home Messages

- Dig into the Brave New World
- Leadership
- Teamwork – Good Communication
- The clock is always ticking
- Train & QI your codes




"That's all Folks!"


In case you couldn't figure it out, this is the end.