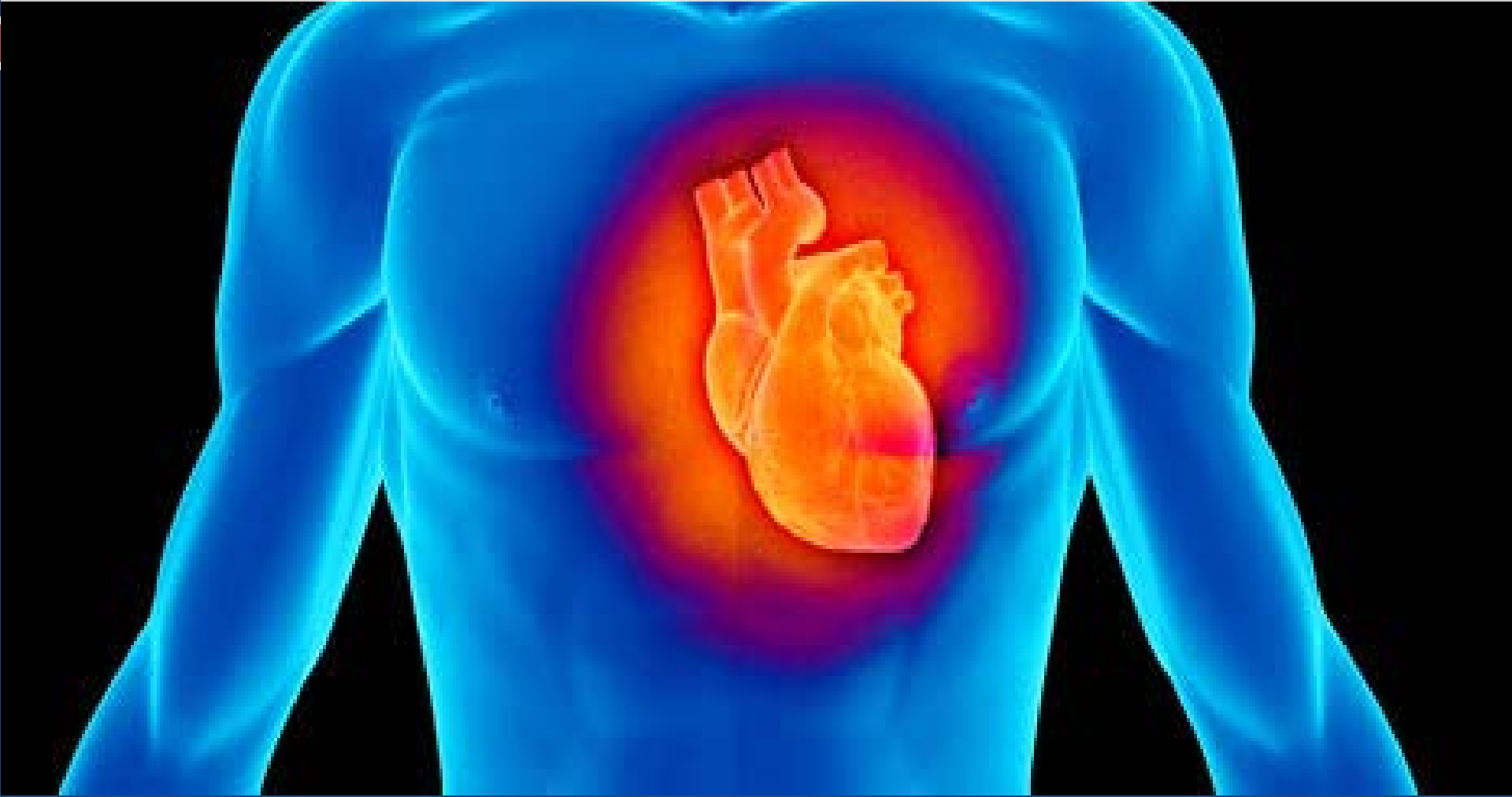


HIGH QUALITY CPR: WHY IT MATTERS!



HealthTrust Resuscitation Webinar Series

A Continuing Education Activity Sponsored by:



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The logo for Pfiedler Enterprises features the word "Pfiedler" in a purple serif font and "ENTERPRISES" in a green sans-serif font. A green, stylized leaf or swirl graphic is positioned behind the text, extending from the right side of "Pfiedler" and curving around the word "ENTERPRISES".

Developed for:



Funding provided by:

The logo for Physio Control, consisting of a solid red square. Inside the square, the words "PHYSIO" and "CONTROL" are stacked vertically in a white, bold, sans-serif font.

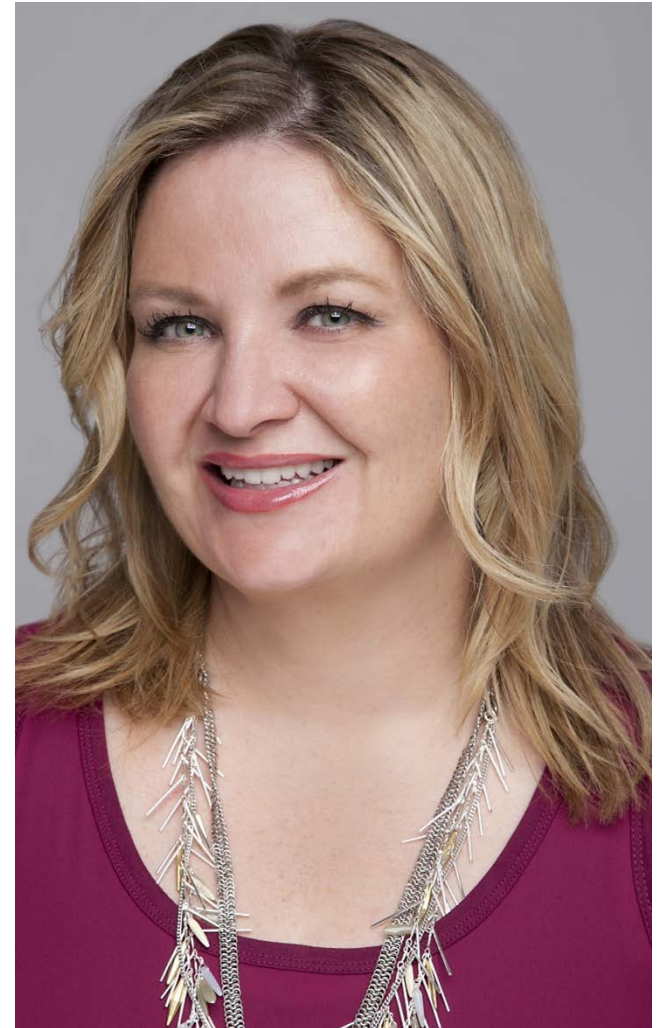
**PHYSIO
CONTROL**

Nicole Kupchik MN, RN, CCNS, CCRN, PCCN-CMC

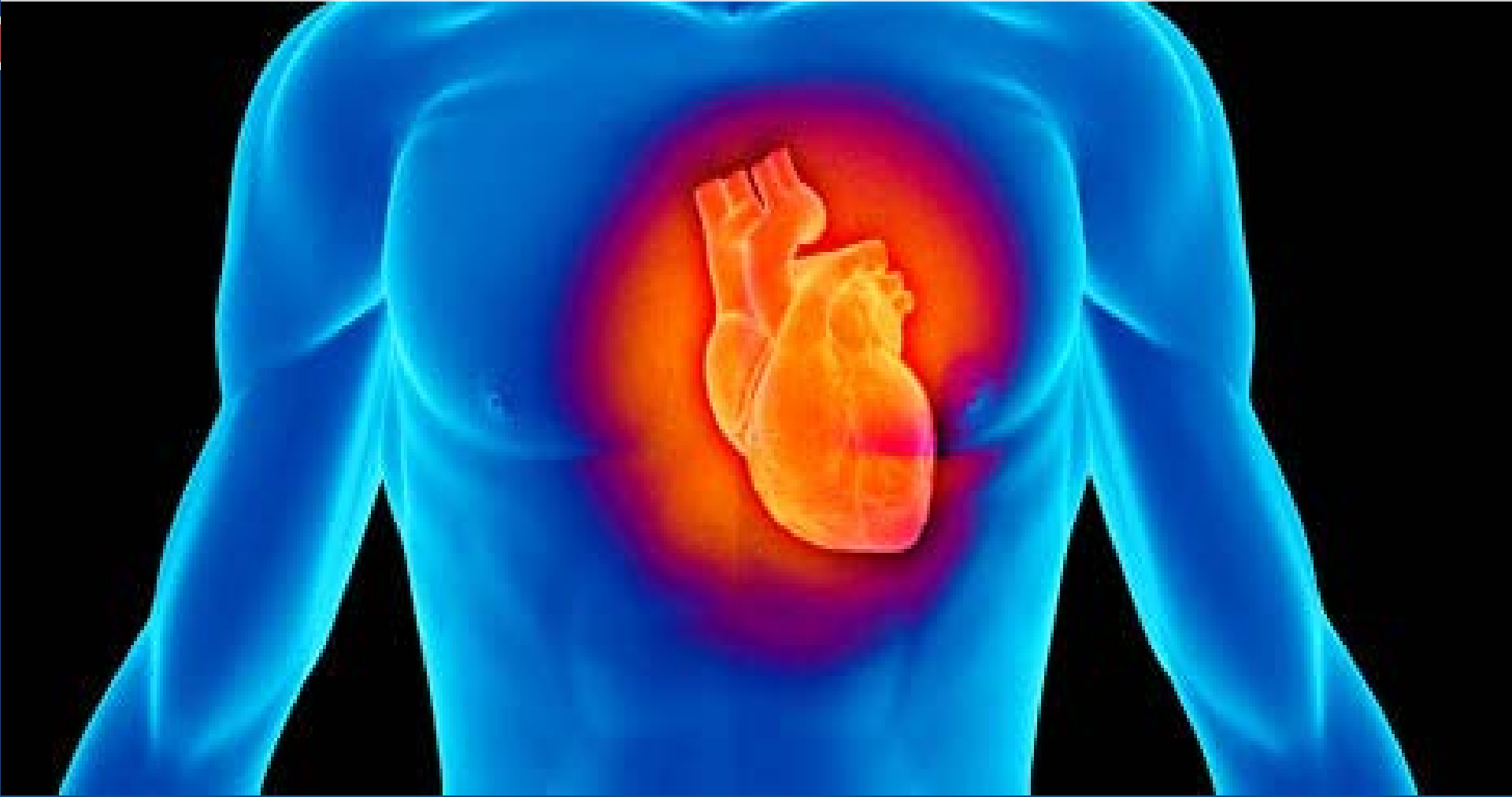
- Clinical Nurse Specialist
- Former Code Blue Committee Co-Chair
- Currently consultant
- Staff Nurse

National resuscitation presentations:

- American Heart Association (AHA)
- Emergency Cardiovascular Care Updates (ECCU)
- Society of Critical Care Medicine (SCCM)
- National Teaching Institute (NTI)
- Emergency Nurses Association (ENA)



HIGH QUALITY CPR: WHY IT MATTERS!



HealthTrust Resuscitation Webinar Series

4-Part Resuscitation Webinar Series

September 28th – What's New with the ACLS & BLS Guidelines?

December 20th – High Quality CPR & Why It Matters!

February 1st – Capnography: It's about more than ventilation!

March 1st – My Patient was Resuscitated, Now What?

Disclosures

- Speaker's Bureau: Physio-Control/Stryker, Medtronic, Mallinckrodt
- Consultant: Physio-Control/Stryker

Objectives

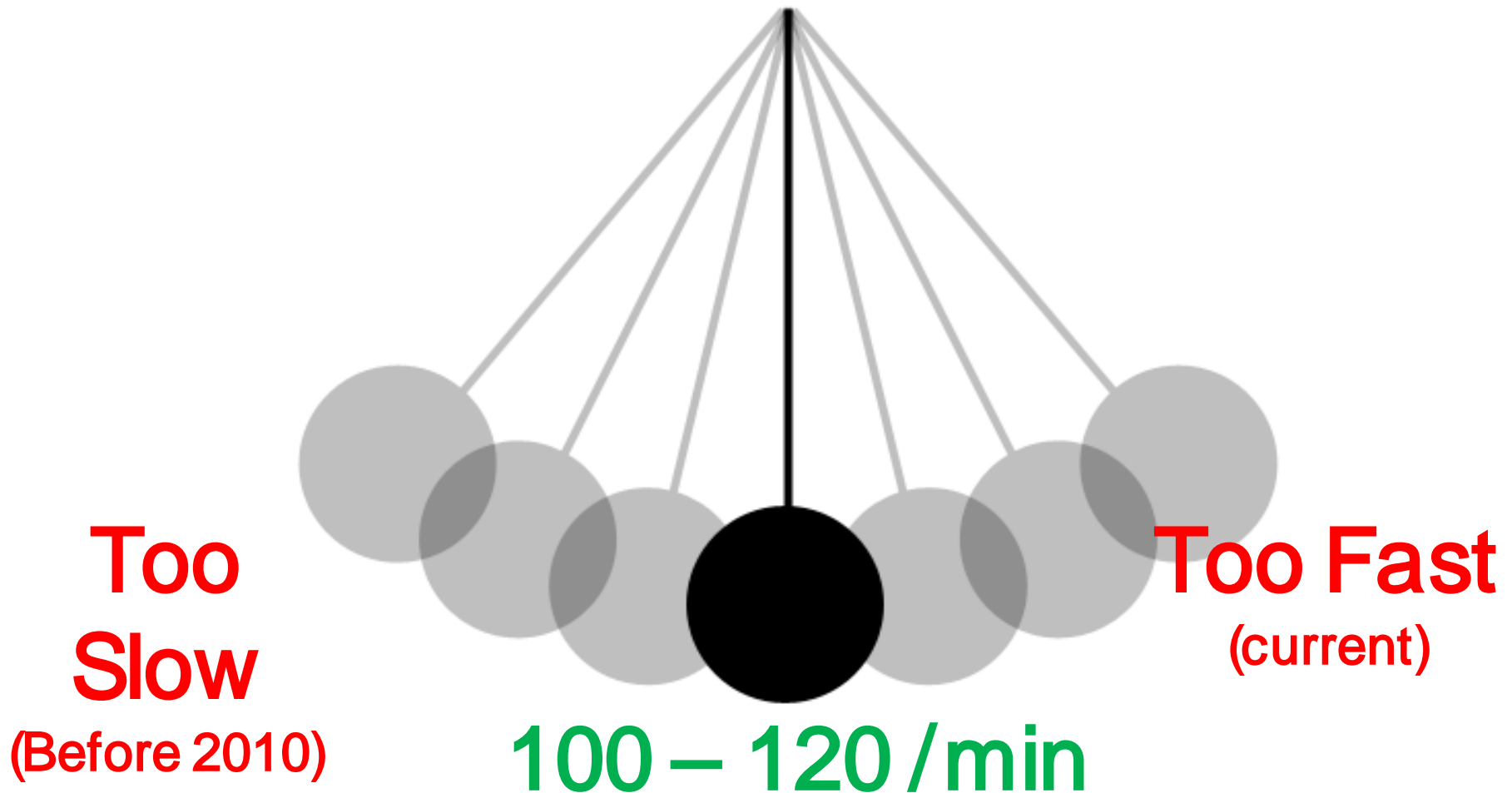
- Discuss the 2015 ACLS & BLS Guidelines specific to CPR quality
- Discuss the importance of measuring CPR quality
- Describe methods of providing post event feedback
- Discuss common issues with CPR quality in hospitals


Recap from our last session:

2015 Guidelines overview

- Chest compression rate 100 – 120/min
 - Depth 2 – 2.4 inches
- Minimize peri-shock pauses
- Do NOT over-ventilate!!!
- Utilize Capnography for ET placement, CPR quality, ROSC
- Medications:
 - Epinephrine 1 mg every 3 – 5 min
 - Amiodarone 300 mg IV for ventricular fibrillation
 - Vasopressin removed from the algorithm

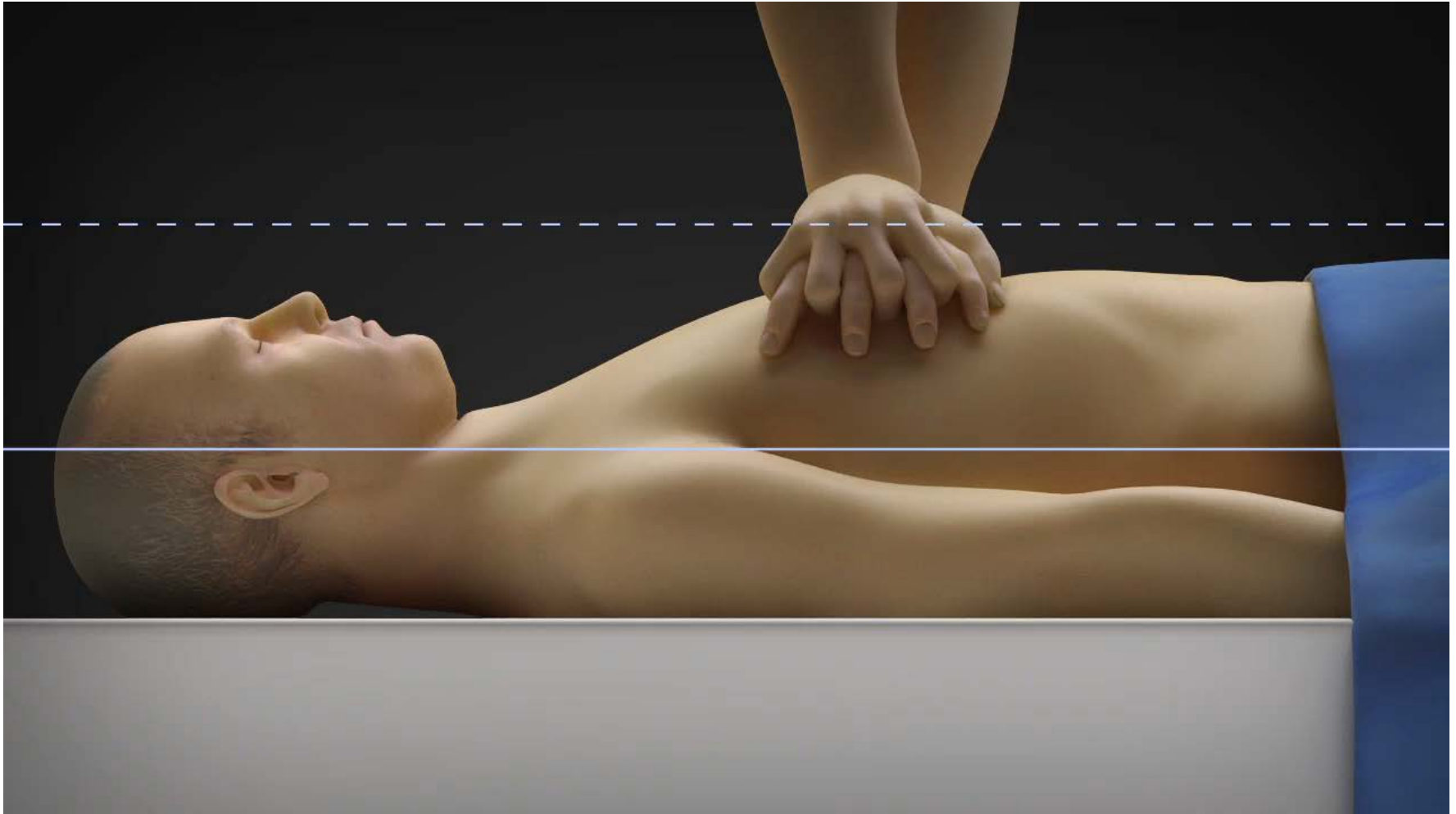
Compression rate mantra in 2010 - “Push fast, push hard”



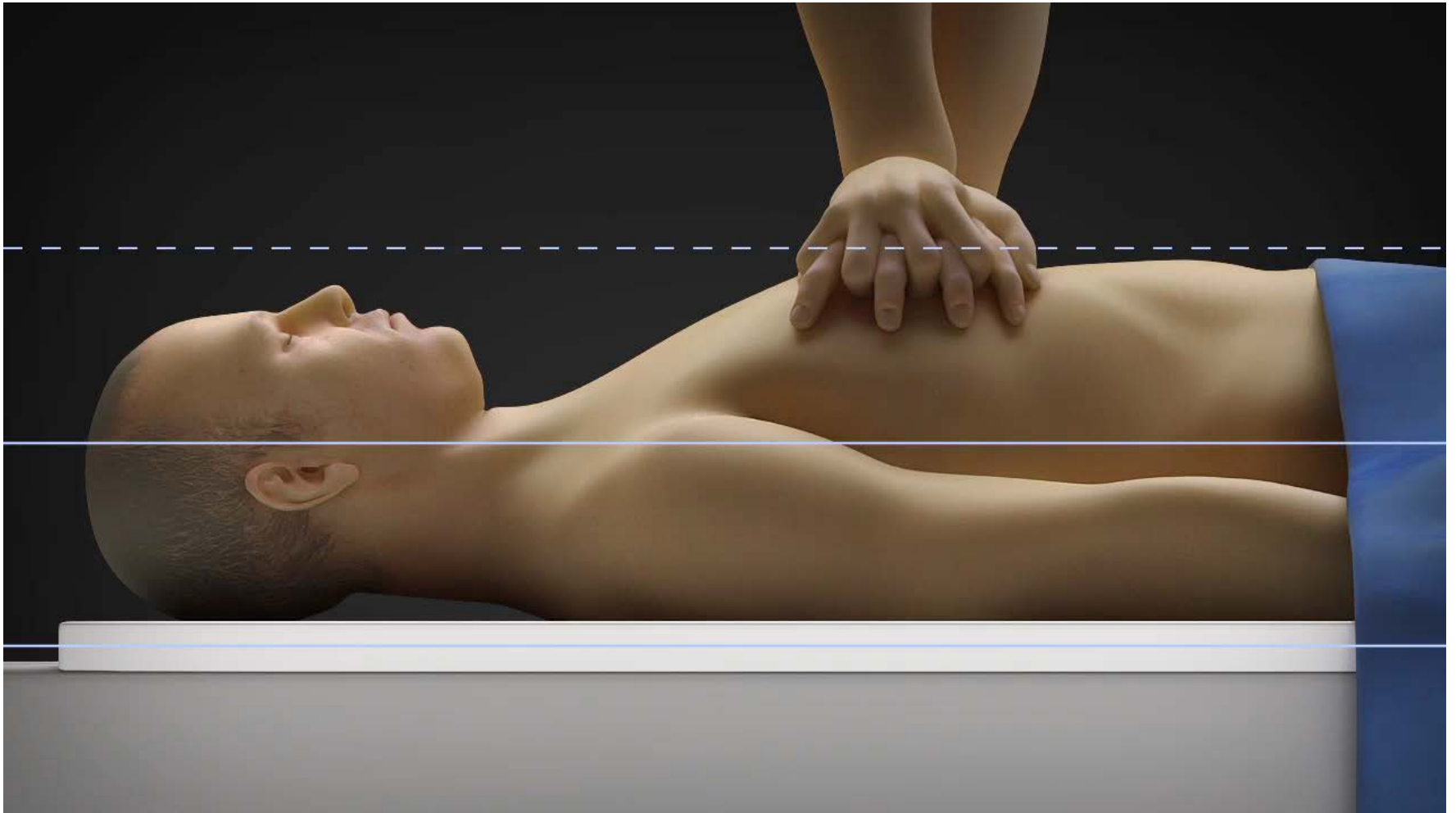


**“Poor quality CPR should be
considered
a preventable harm”**

CPR on a Mattress



CPR with a Backboard



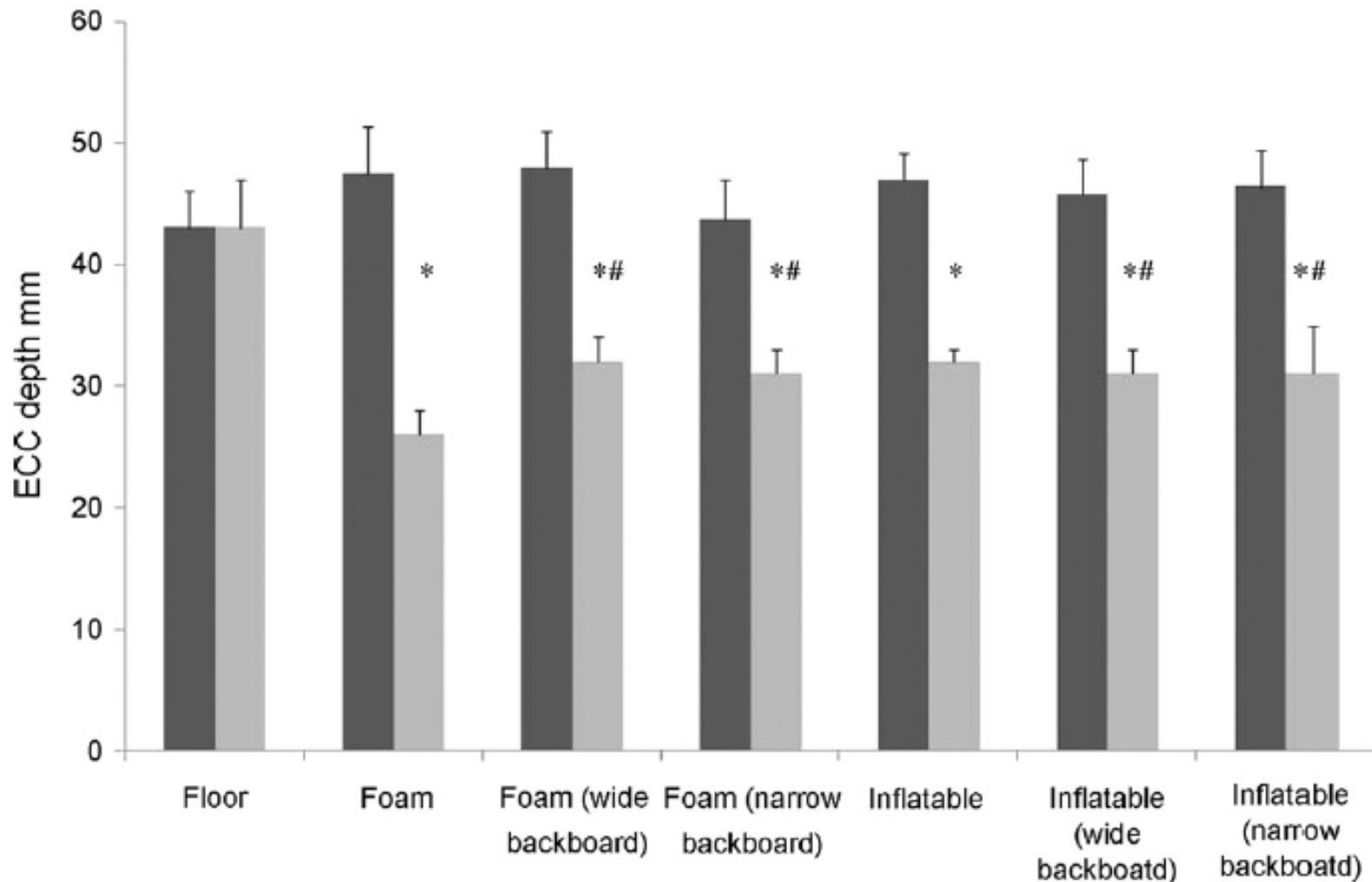
Intra-arrest Feedback

- Metronomes
- CPR feedback devices



Feedback on: CPR rate, depth, recoil

Accelerometer CPR Depth



Chest Compression Fraction

- The amount of time spent providing compressions
- May also be called “chest compression ratio”
- Goal: As high as possible!
 - Guidelines: at least 60%
 - **Is it acceptable to be off the chest 40% of an arrest?**
 - High performing hospitals & EMS:
> 80 – 90%



“Hot Debrief”



- Ideal –
 - correct bad CPR as it happens
- Download data from devices used during the arrest
- Immediate post-event review
- What went well?
- What can we do DIFFERENT next time?
- Were there any safety or equipment concerns?

AHA Consensus Recommendation

2013 Consensus Recommendation

“...resuscitation data from the defibrillator or any other device or source documentation that captures data at the scene should be used for feedback to the team.”

Post-Event Debriefing

- Data automatically downloads from the defibrillator
- Evaluate CPR quality
 - Rate
 - Depth
 - Chest Compression Fraction
- Time to defibrillation
- Peri-shock pauses
- Assisted ventilation rate



Does debriefing post-event improve outcomes?

Pediatric patients 8 years or older

119 cardiac arrest events

60 Control, 59 Intervention

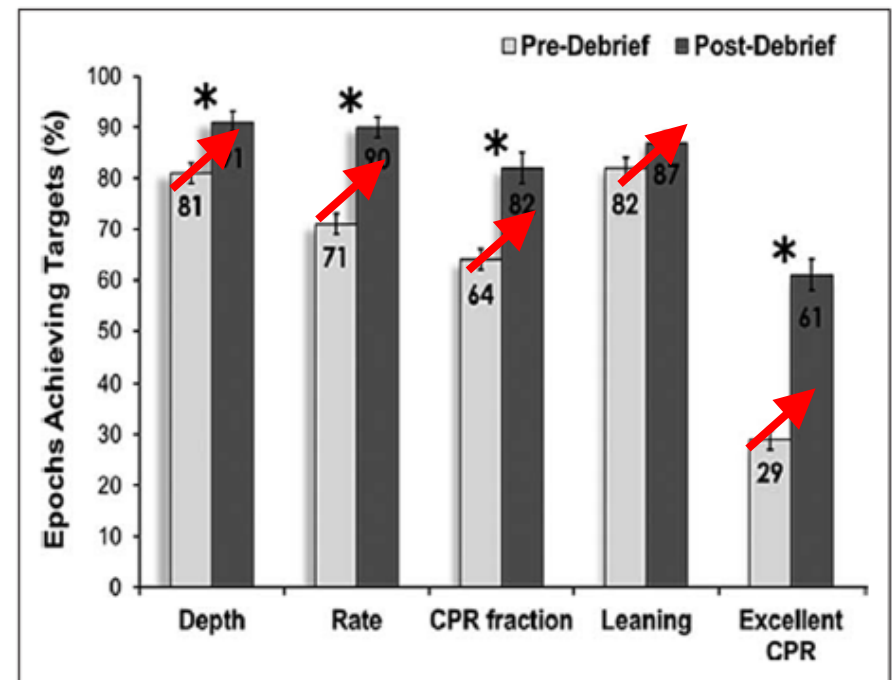
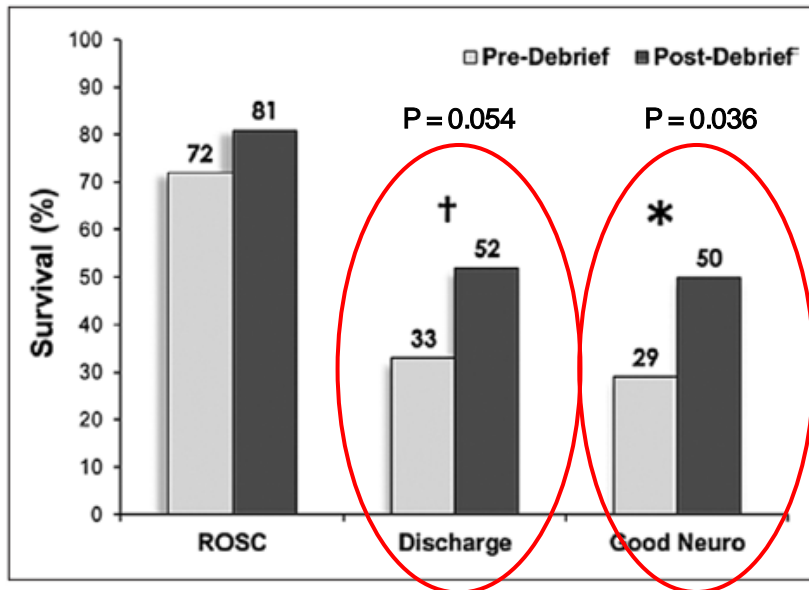
Prospective quality improvement interventional trial

Debriefing: **Safe environment**

- Patient history
- Pre-arrest studies (radiographs, CT scans, labs)
- Quantitative resuscitation data
- Patient Outcome & Summary

Four Targets: “Excellent CPR”

- Depth ≥ 38 mm
- Rate ≥ 100 /min
- CPR Fraction $> 90\%$
- Leaning $< 10\%$





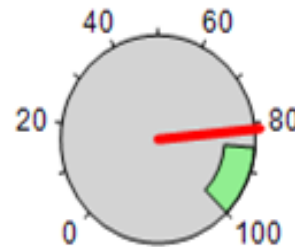
ISSUES WITH CHEST COMPRESSION RATE



Intra-Arrest Review

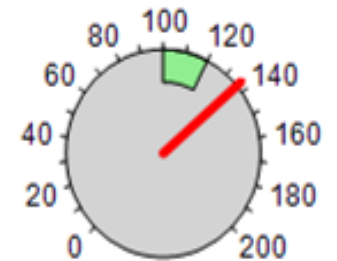
**Compression
fraction
Goal:
at least 80%!**

Compressions Ratio
(/total time)

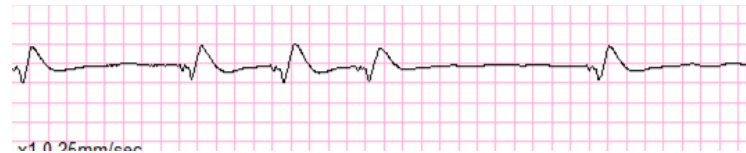


3:54 / 4:48 = 81 %

Compression Rate



137/minute



CPR QUIK-VIEW



Interval Statistics

Compr. Ratio, %	Compr. Rate	Compr. /min
62	137	85
100	129	129
57	128	73
89	142	124
100	143	141

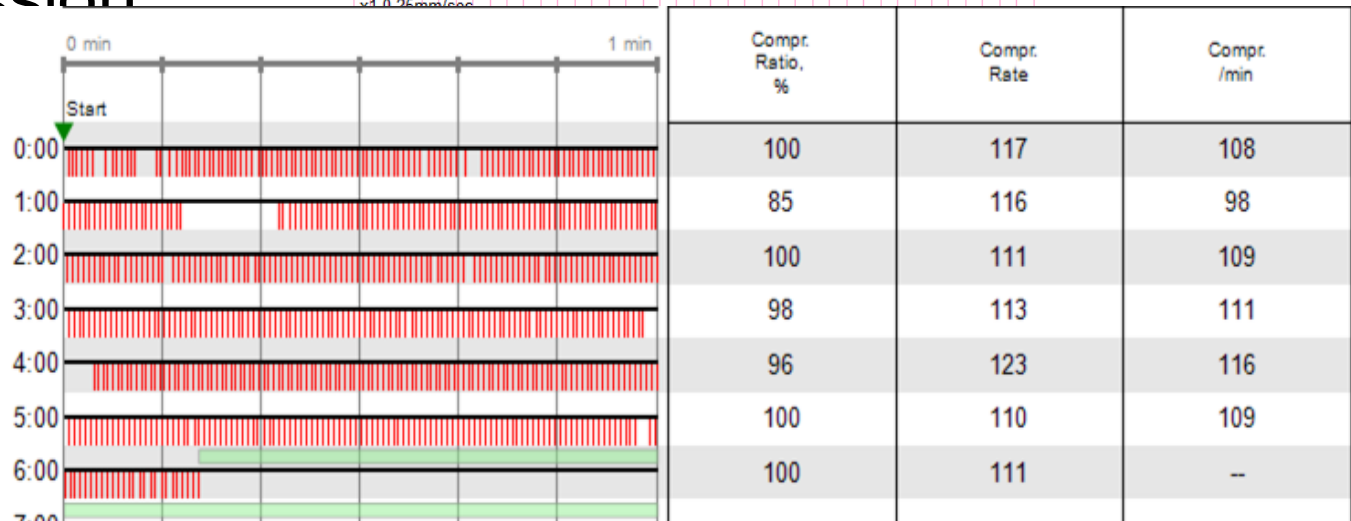
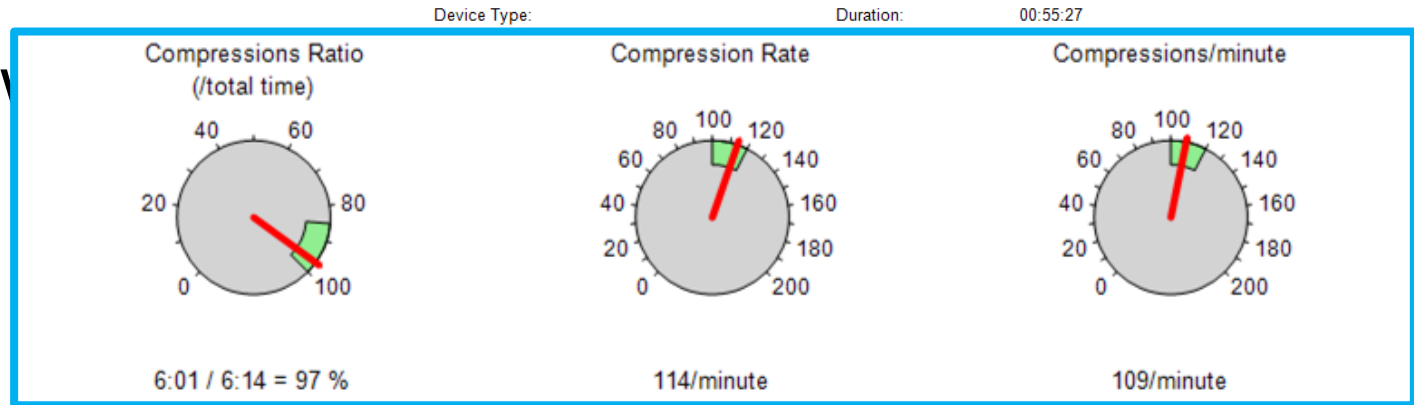
2 months after giving feedback to teams


□ ED patient with STEMI

□ PEA arrest


□ Compression fraction

□ What do we know about the



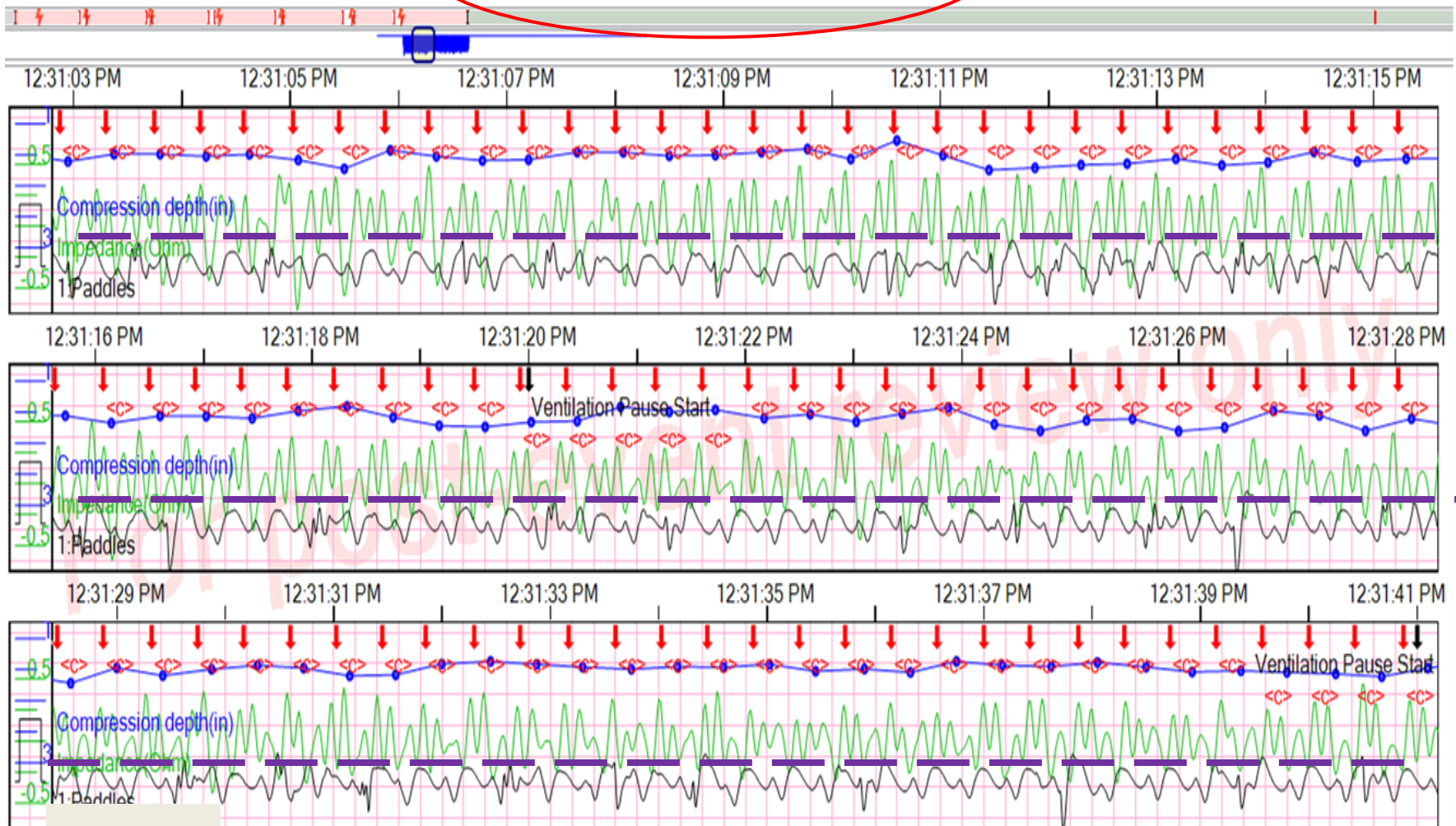


ISSUES WITH CHEST COMPRESSION DEPTH



Depth with fast CPR rates

CC Rate 141



Minute by minute breakdown


Pauses over 10 sec

= 4


CPR QUIK-VIEW

Interval Statistics

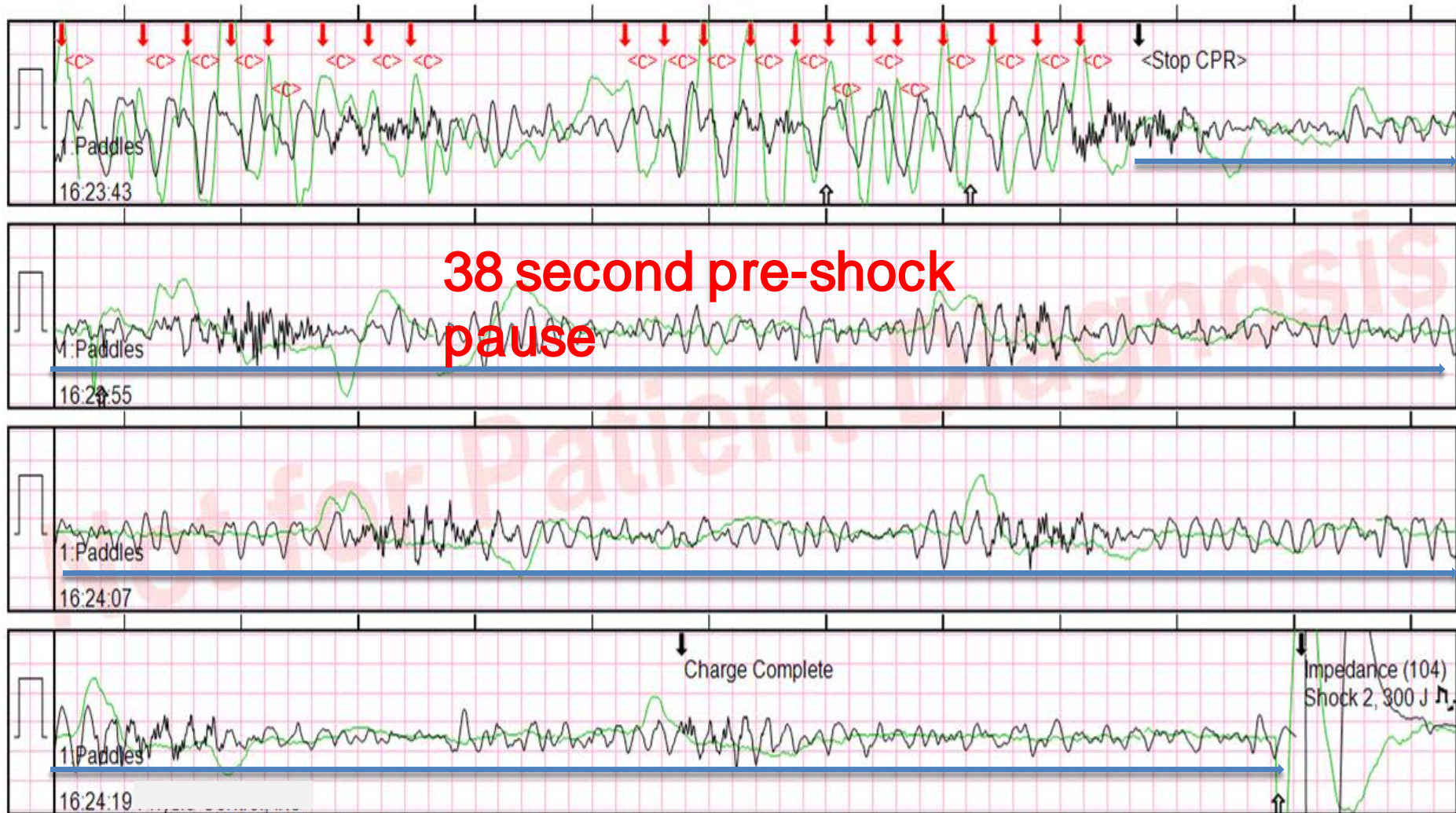




ISSUES WITH DEFIBRILLATION & CHEST COMPRESSION PAUSES



Case #1 - Pre shock pause issues



Case #2 – 2 mos later - Improvement



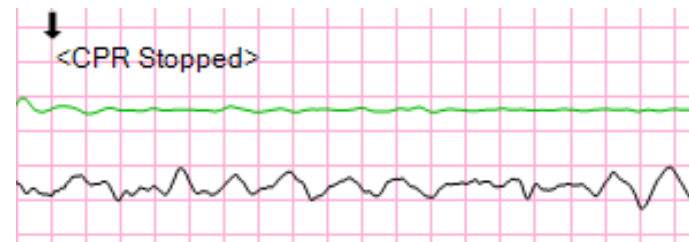
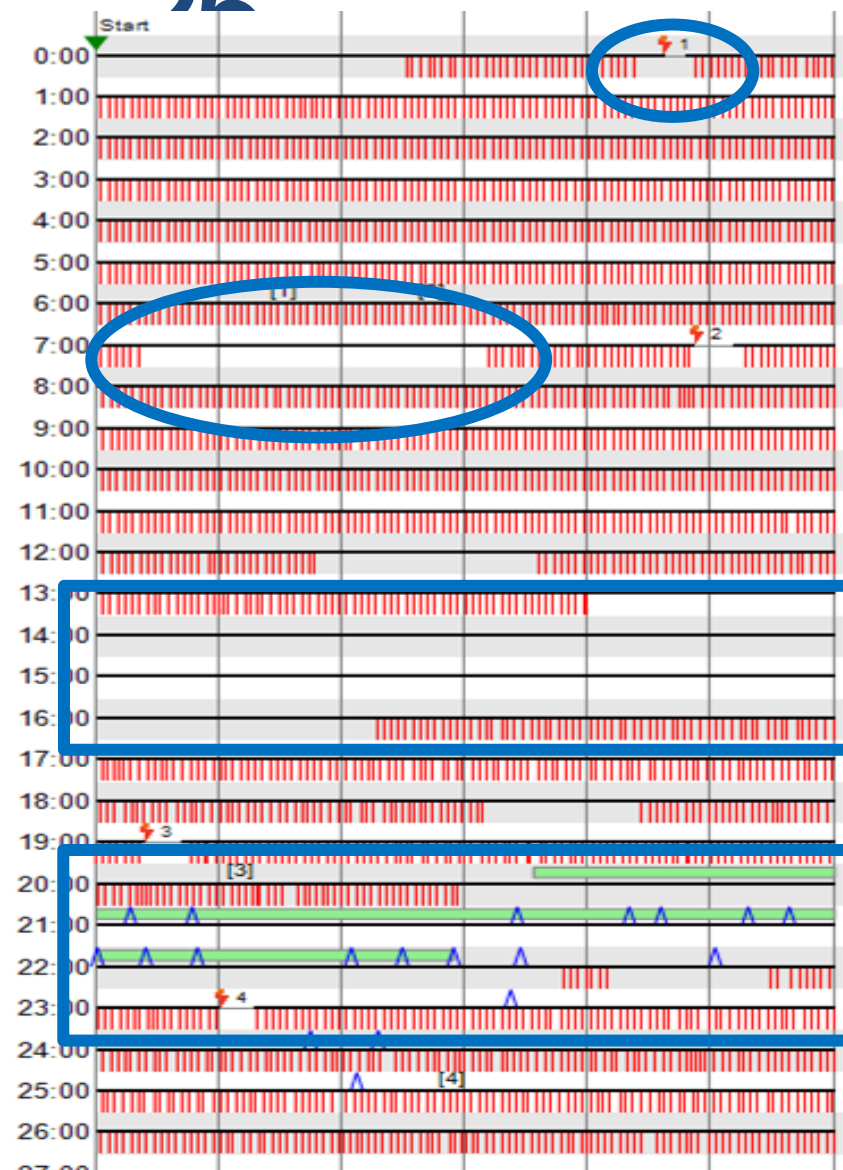
Case #3 –

Minimized pre & post shock pauses

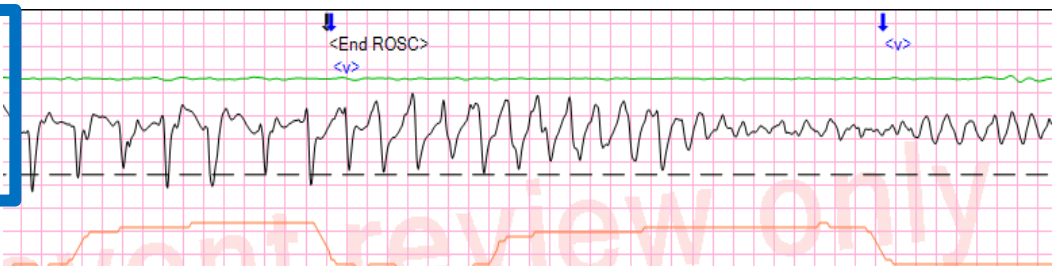


60 minute case....Minutes 1 -

26

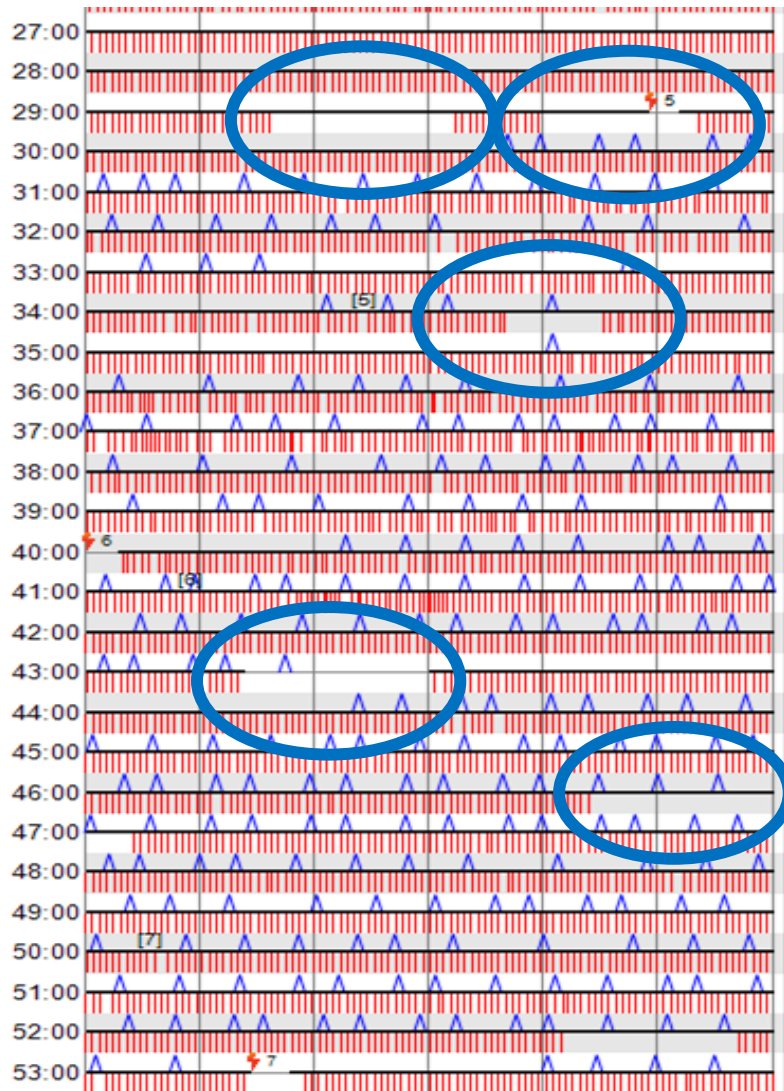


Longest compression pause	= 2:42	Pauses over 10 sec	= 10
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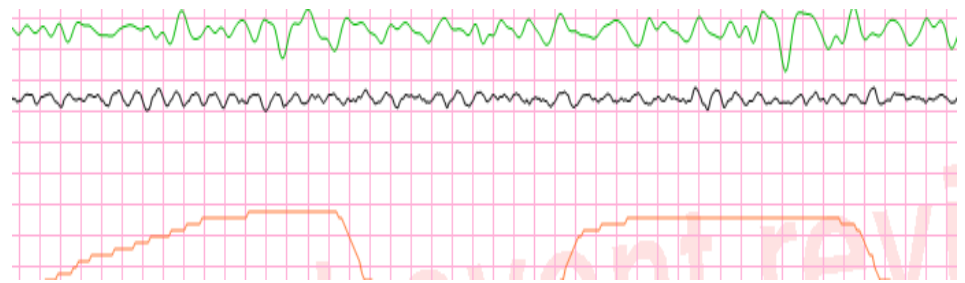
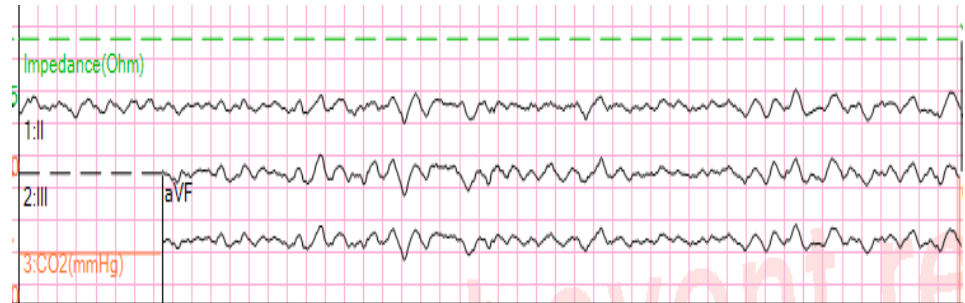


front review only

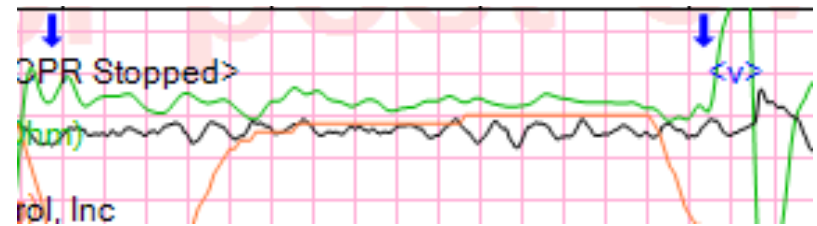
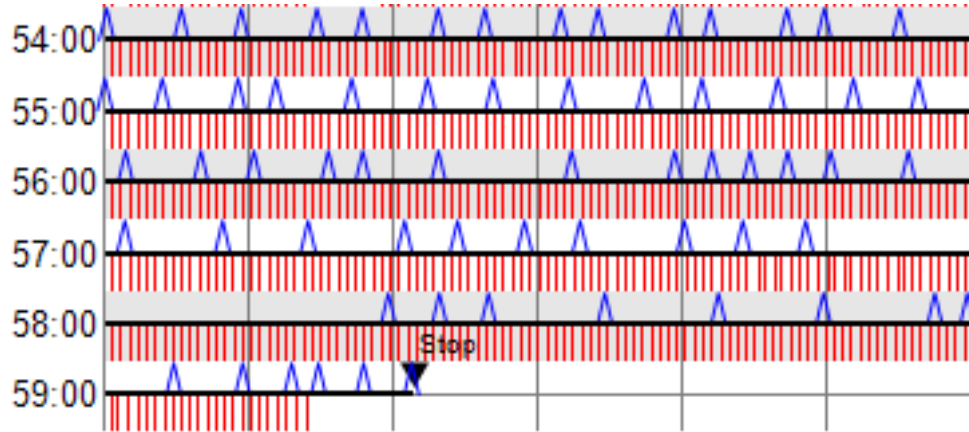
Minutes 27 - 53



**Patient remains in VF at
minutes 34, 43 & 46 – no shock**



Minutes 54 - 59



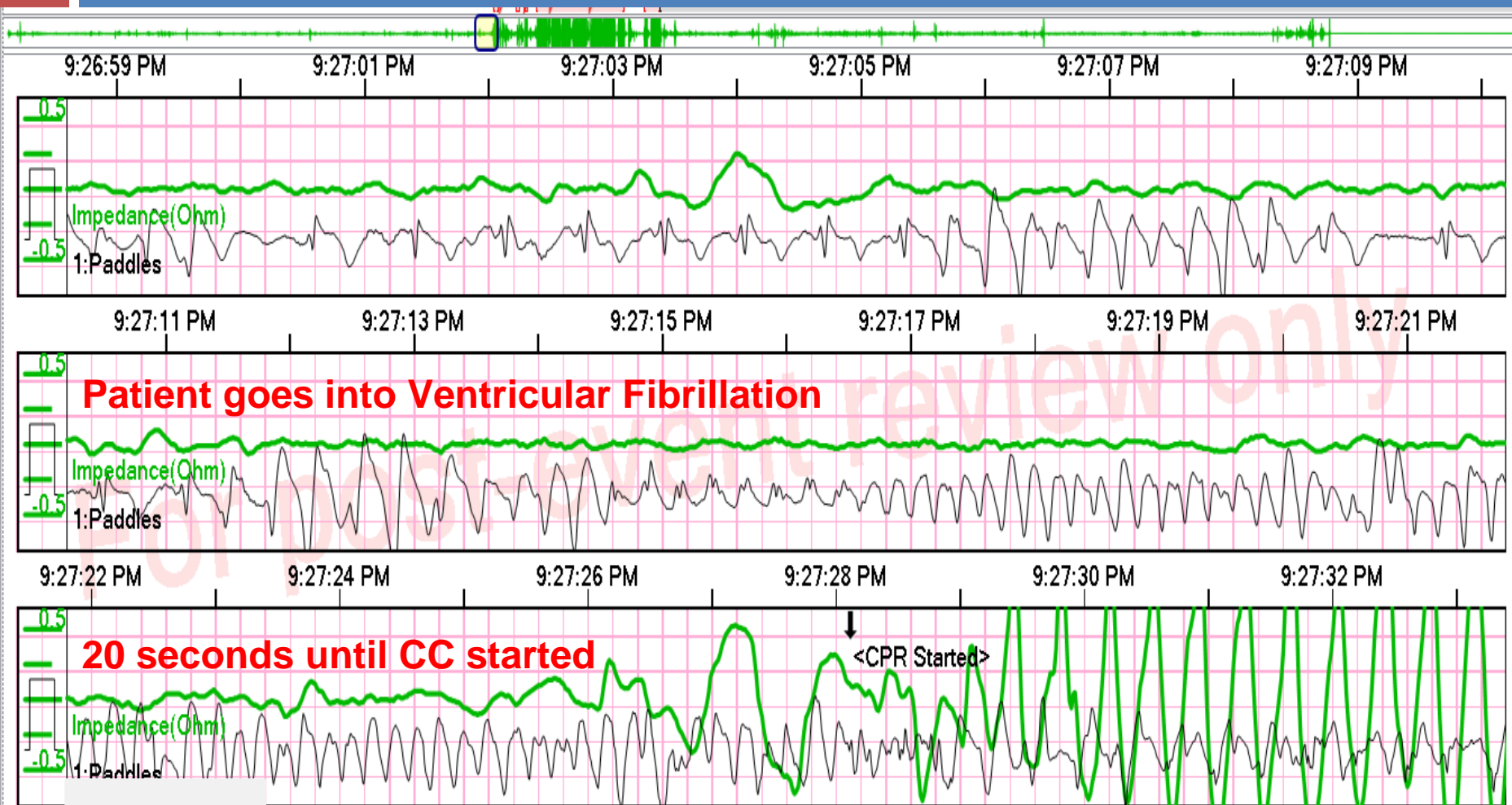
Shock	Time	Energy
⚡1	0:46	200J
⚡2	7:49	300J
⚡3	19:04	360J
⚡4	23:10	360J
⚡5	29:49	360J
⚡6	40:00	360J
⚡7	53:15	360J

How many shocks should have been delivered for a 60 min VF case?

AT LEAST 30!!!!

STEMI – Vfib Arrest

Chest Compressions – 1 of 3

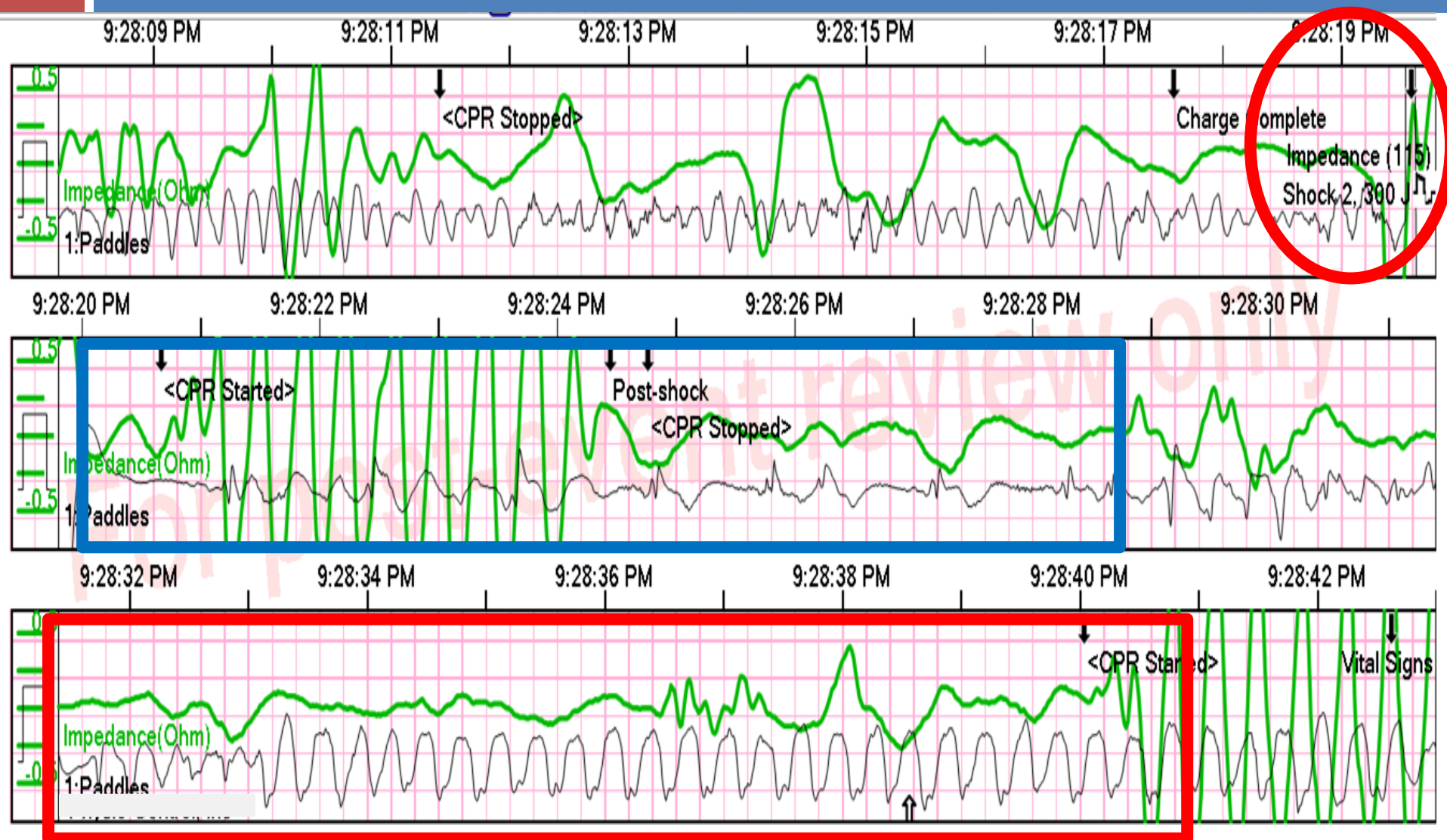


Chest Compressions – Shock 200J, Organized Rhythm – then Vfib - 2 of 3

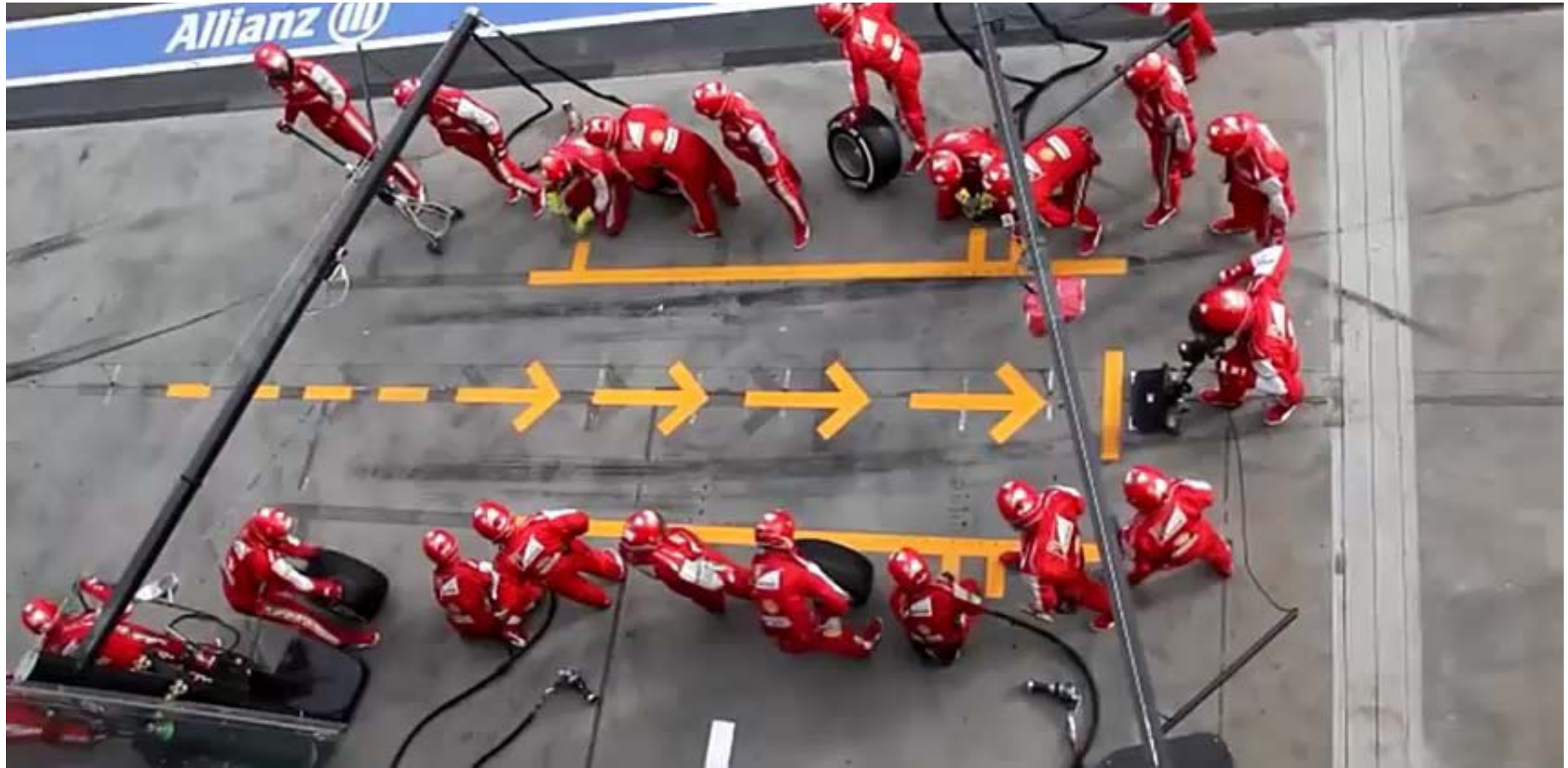


Vfib – Defib 300J – 8 CC

Back into Vfib - 3 of 3



Are humans as important as NASCAR?



Typical Defibrillation

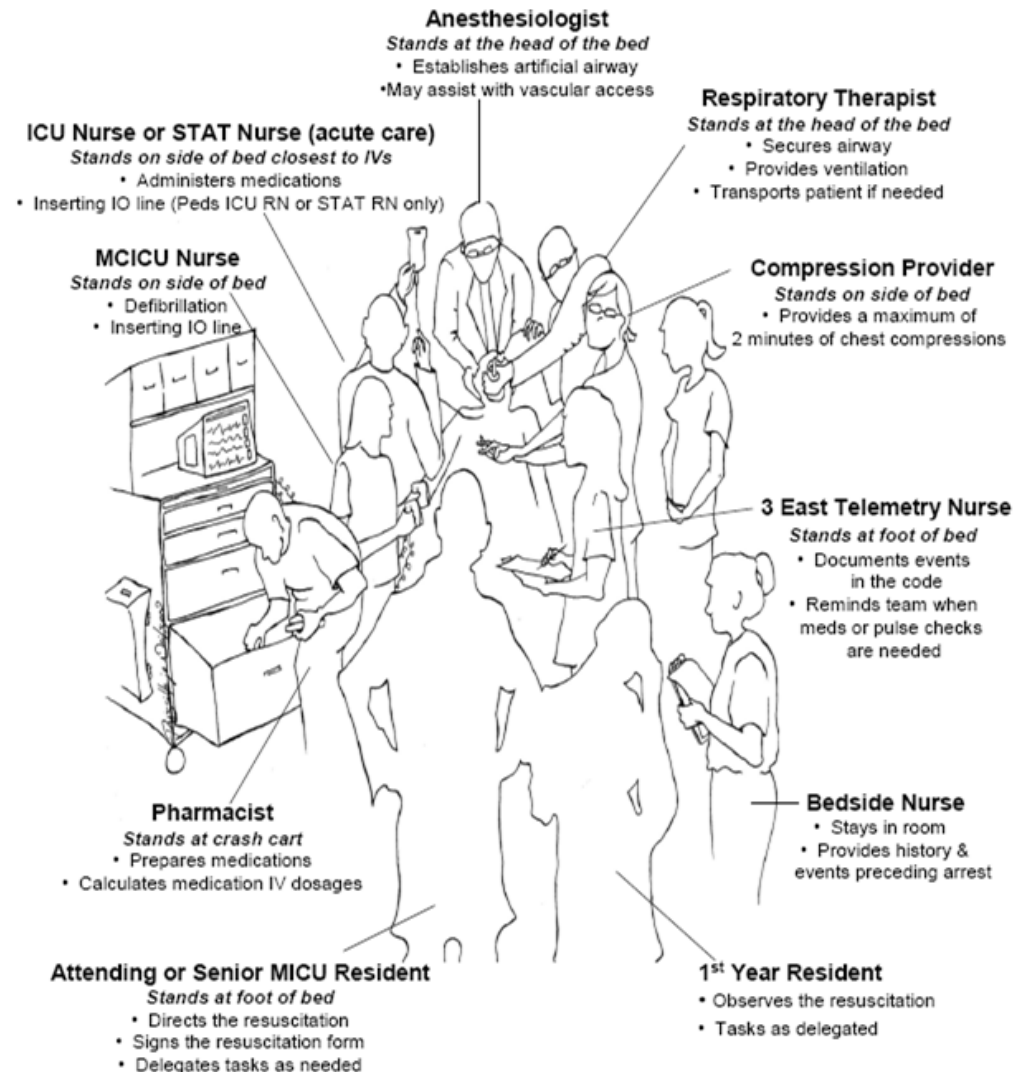


Ideal Defibrillation



High Performance Team

- Clear team leader
- Understand not only your role, but the role of others on the team
- Anticipate what needs to happen next



Other Code Blue Team Members:

Lab: Performs blood gas analysis ensures the team is aware of the results; **Spiritual Care:** Stays with family during resuscitation; **Nursing Supervisor:** Ensures adequate staff on unit; assigns ICU bed if needed

Mechanical CPR Devices



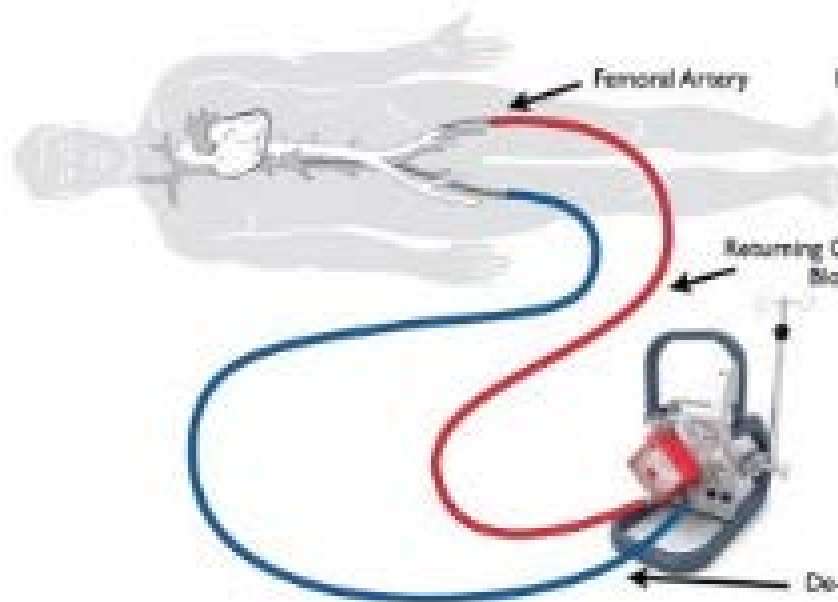
2015 Feedback & Mechanical Devices

Levels of Evidence – ILCOR/AHA

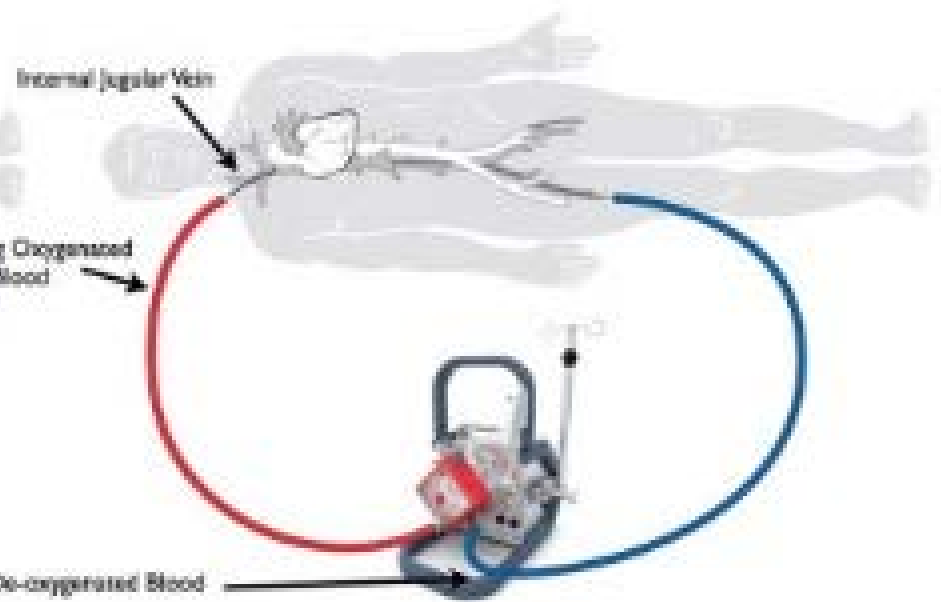
Recommendation	Class	LOE
Using feedback devices to guide compression quality	IIb	B-R
The use of mechanical compression devices may be a reasonable for use by properly trained personnel.		
The use of mechanical compression devices may be considered in specific settings where the delivery of high quality manual compressions may be challenging or dangerous to the provider.	IIb	C-EO
ECPR– Venous/ Arterial ECMO may be considered for refractory cardiac arrest when the cause is likely reversible	IIb	C-LD

E-CPR: V-A ECMO, Mechanical Chest Compressions & Cath Lab

VA-ECMO



VV-ECMO



E-CPR



In conclusion,


- HIGH quality CPR & early defibrillation matters!
- CPR feedback devices & post event review should be considered to monitor quality
- Post event review is helpful in identifying chronic performance issues
- Targeted training

**YOU WON'T IMPROVE WHAT YOU DON'T
MEASURE!!!**

Questions?



Following the Q & A session, the webinar will adjourn, and you will be directed to the course evaluation and printable certificate.



**Thank you for attending this
continuing education
presentation.**

Upcoming Webinars:

