



Using Ultrasound To Guide Management In Cardiac Arrest

Kimberly Pruett, MD
University of New Mexico
Albuquerque Fire Rescue

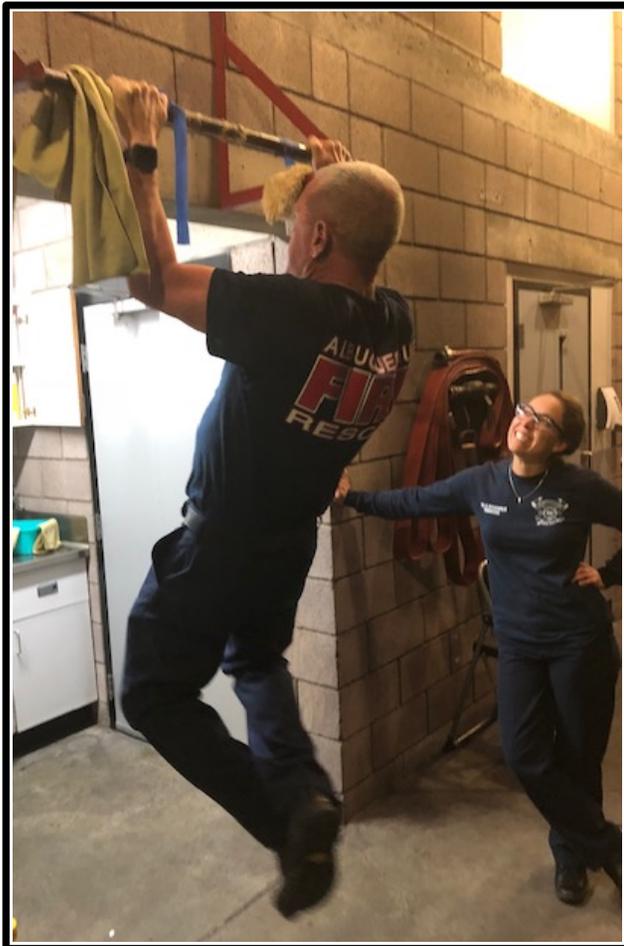
I Have No Disclosures

Phillips Lumify and Android Tablet



Albuquerque Fire Rescue “78s”

Highly experienced field paramedic captains



UNM EMS Fellows



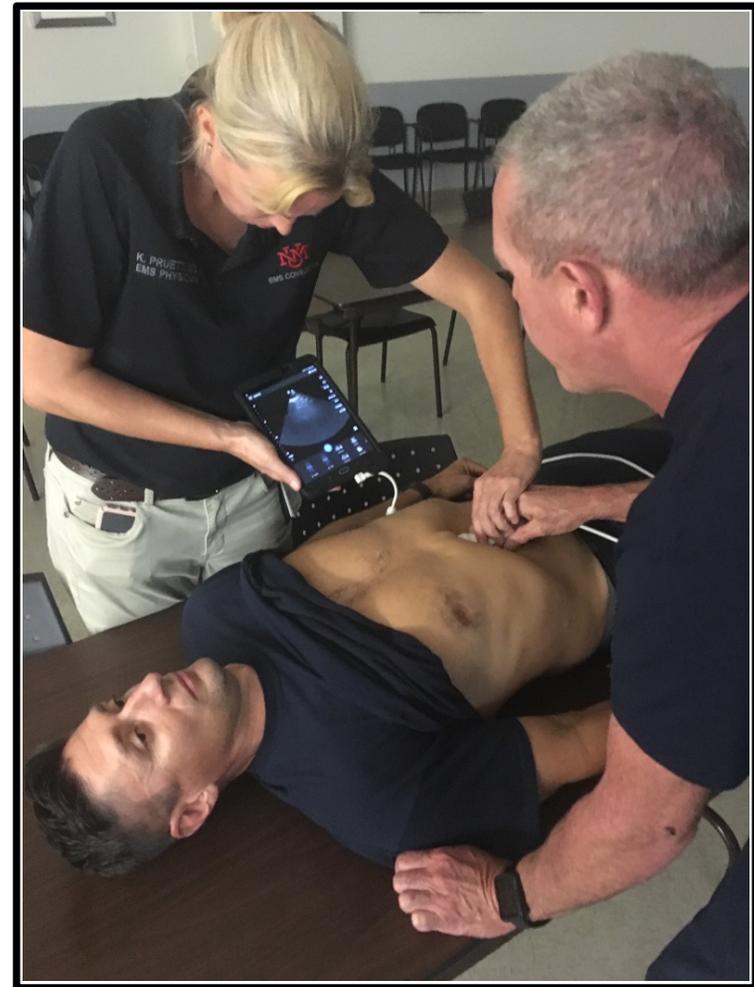
24/7 Scene Response and On-Line
Medical Direction

Ultrasound Approval Process

- Apply to NM State EMS Board
 - Paramedic Special Skill
 - Cardiac arrest only
- Report outcomes at 1 year
 - Frequency of usage
 - Outcomes
 - QA metrics



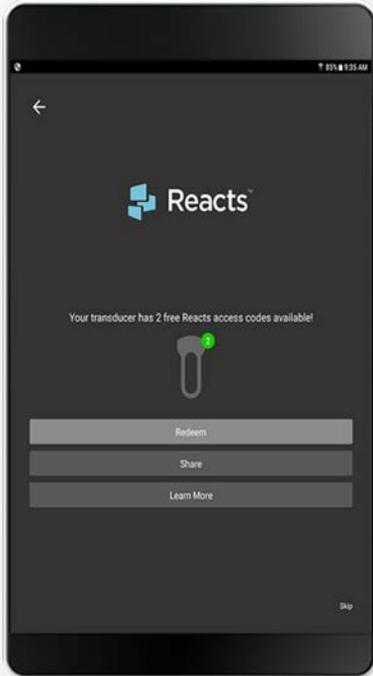
8 Hours Didactic and Hands-On Training With EMS Physician Faculty



Is There Any Squeeze?

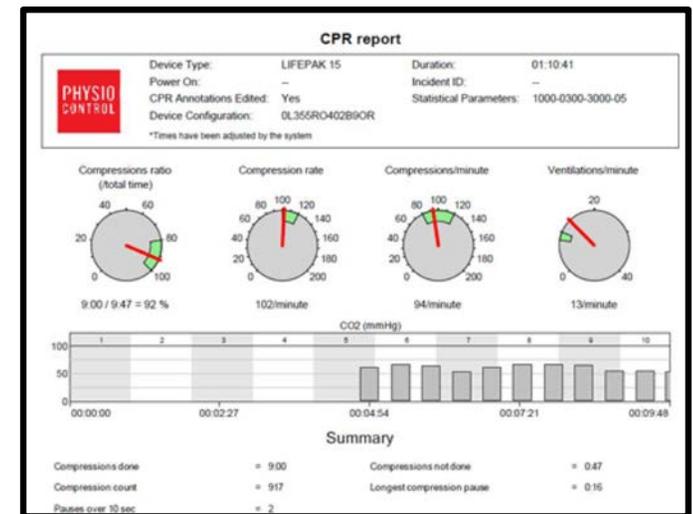


Quality Assurance Measures



A web interface for 'ELITE FIELD' showing 'Unit & Crew Info'. The interface includes a sidebar with navigation options: 'Response' (selected), 'Unit & Crew Info', 'Response Info', 'Times/Mileage', 'Patient Encounter', 'Transport', 'Billing', 'Narrative', and 'Signatures'. The main content area displays the following information:

- EMS Agency Number: 00939
- EMS Unit Call Sign: [Dropdown menu]
- EMS Vehicle (Unit) Number: [Dropdown menu]
- Primary Role of the Unit: [Radio buttons for Ground Transport, Non-Transport First Responder, and Extrication or Other Specialty Unit]
- Level of Care of this Unit: [Dropdown menu]
- Crew Members: [Add button]



Case Studies



46 Year Old Female “Sick”

- PMH: COPD, PE with IVC filter, hypothyroid, adrenal insufficiency, HLD, GERD
 - “Not feeling good since yesterday”
- Arrested on EMS arrival
 - ACLS initiated
 - LMA placed
 - IO access



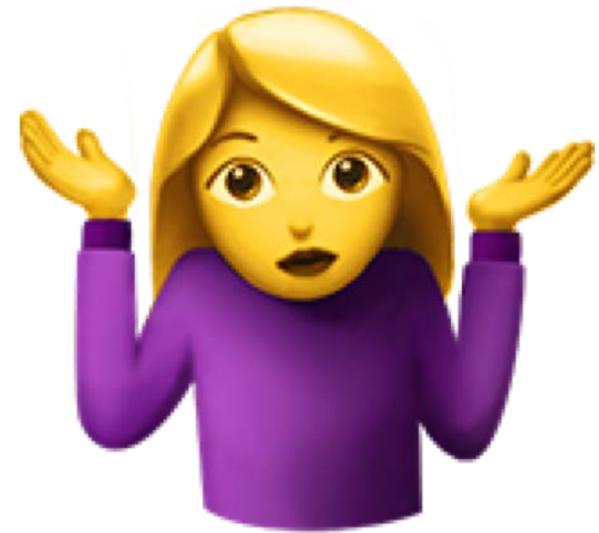


PEA 60-80
End Tidal 50-60

What Does The End Tidal Increase Suggest?



Just Good CPR?



ROSC?

Cardiac Ultrasound



Cardiac Ultrasound



LEVOPHED

Strength _____ mg/mL

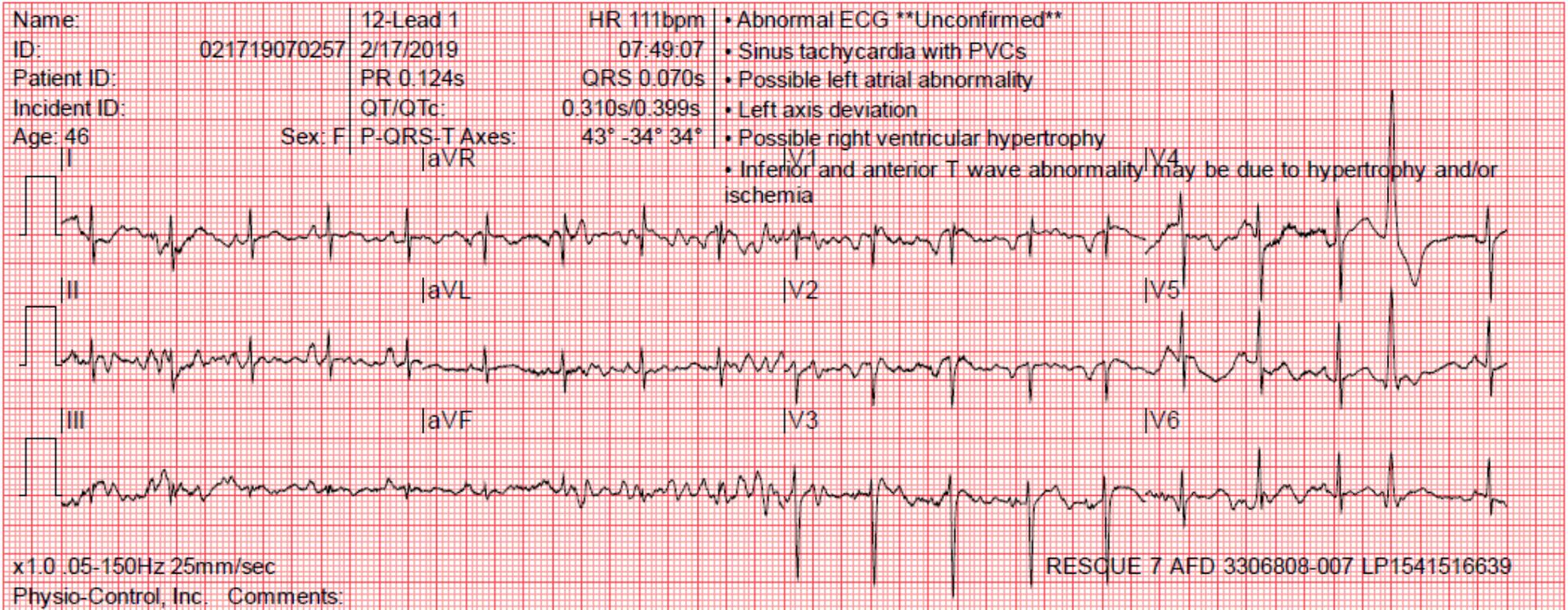
Exp. Dt./Tm. _____

EPInephrine

Strength _____ mcg/mL

Exp. Dt./Tm. _____

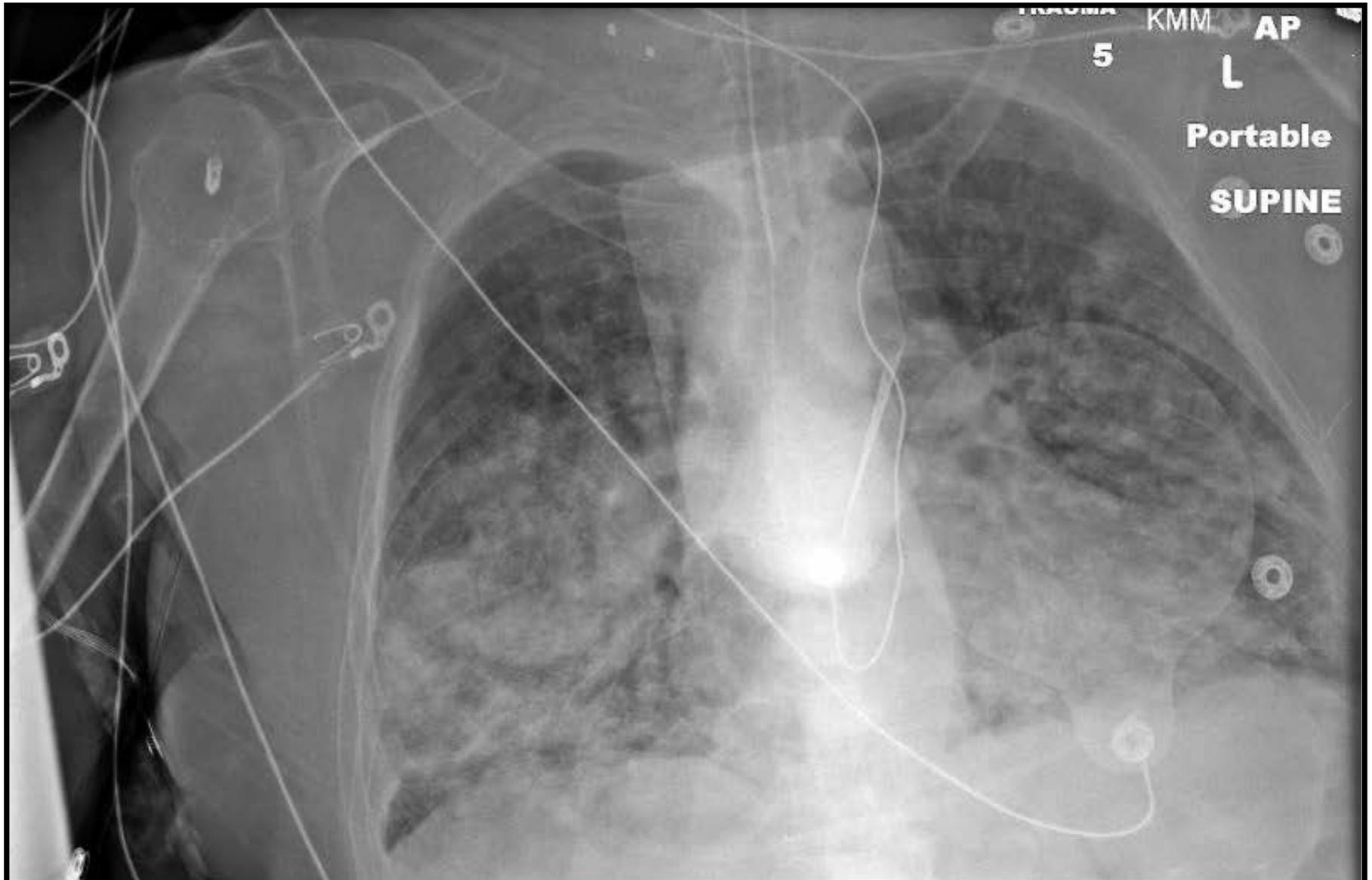
Post ROSC 12 Lead EKG



ST measurements are measured at the J point and are expressed in mm.

I	II	III	aVR	aVL	aVF	V1	V2	V3	V4	V5	V6
0.03	-0.04	-0.02	0.01	0.08	-0.05	0.19	0.00	0.51	0.01	0.64	0.12

To ensure printer accuracy, confirm that the calibration markers are 10mm high and the grid squares are 5mm wide.



Multifocal Pneumonia



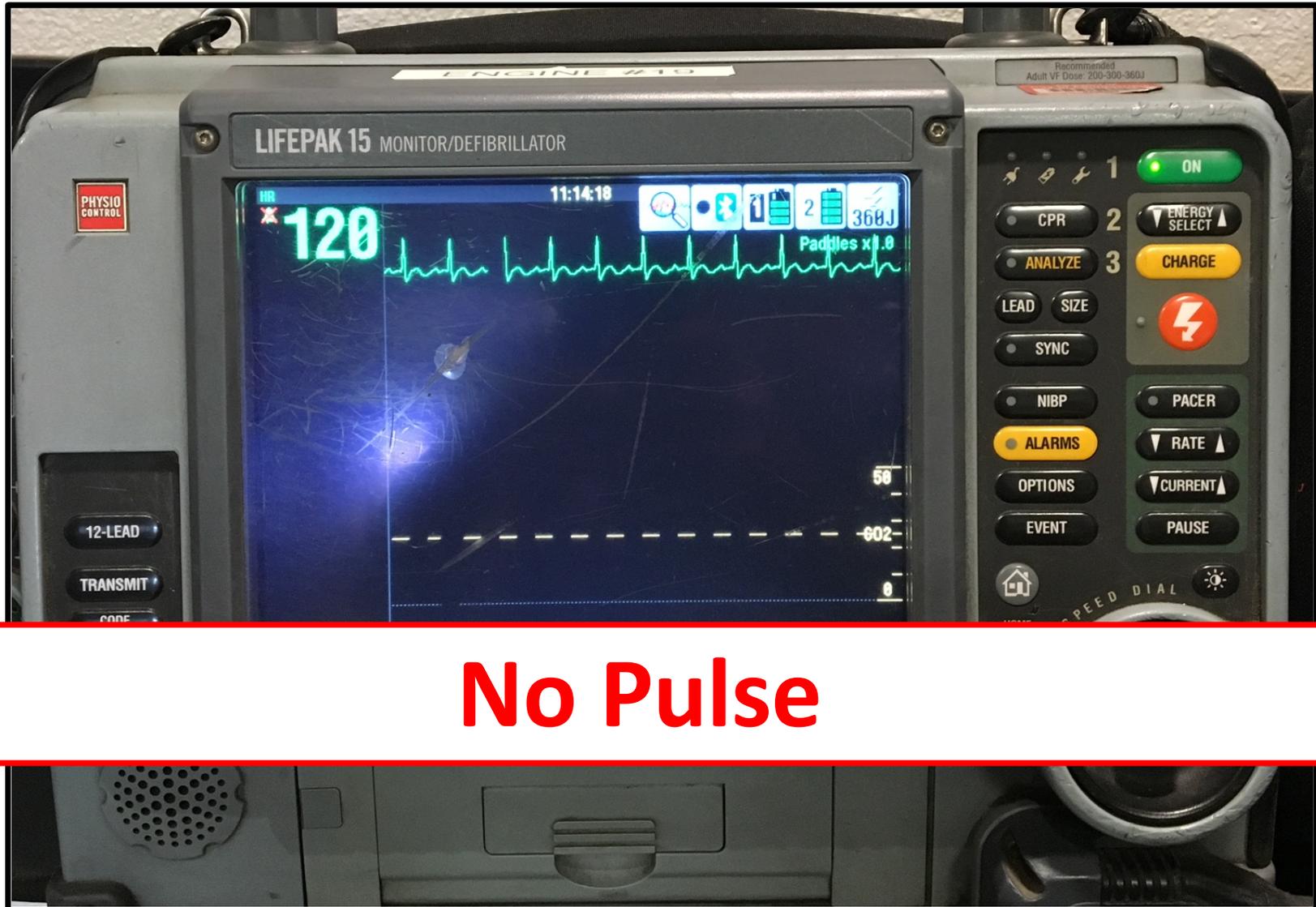
Awake and Following Commands

27 yo Male, Unresponsive

- Family finds him in the bathroom
- Bystander CPR
- Asystole → PEA → V-Tach → PEA
- ACLS
 - IO
 - 3 Rounds of EPI
 - LMA and BVM



PEA Near 100 Consistently
Initial End Tidal 10 → Now 30

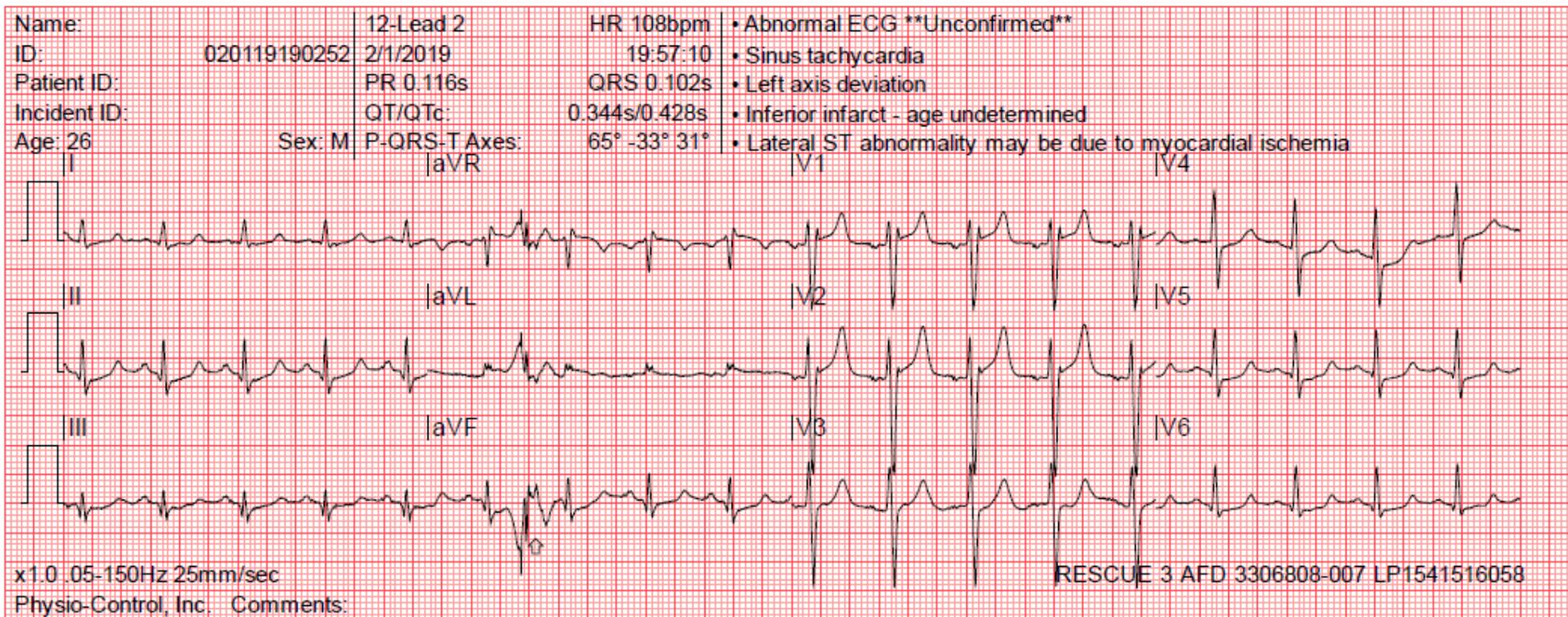


No Pulse

Ultrasound Images



Post ROSC



ST measurements are measured at the J point and are expressed in mm.

I	II	III	aVR	aVL	aVF	V1	V2	V3	V4	V5	V6
-0.27	-1.29	-1.02	0.78	0.36	-1.16	0.87	0.88	-0.36	-1.28	-1.15	-0.83

To ensure printer accuracy, confirm that the calibration markers are 10mm high and the grid squares are 5mm wide.

Outcome

- Anoxic brain injury
- Comfort care
- Died next day



89 Year Old Male SOB

- Recently released from hospital for bradycardia
 - Awaiting pacemaker placement
- Arrests on EMS arrival
 - Immediate Pit Crew CPR
 - Narrow, Slow PEA



Ultrasound Changed Our Direction

- Atropine
- Epi Drip
- Pacing
 - Could not capture



Proceeded to asystole confirmed by US

Conclusions

- Ultrasound can be used by experienced and well-trained paramedics to guide resuscitation management in cardiac arrest
 - Really helpful in PEA arrest
- Need to be careful about time off the chest while trying to get a good view

Questions?

Kpruett@salud.unm.edu