TWO EASY PIECES

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WE'VE BEEN CHASING THIS HOLY GRAIL

- Performance measurement and quality in EMS
- For almost as long as we've been chasing response times

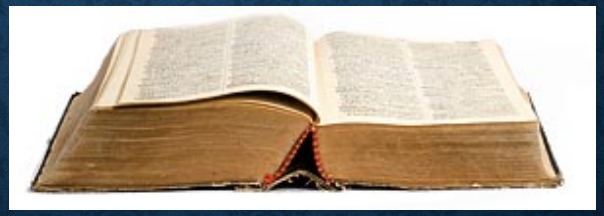
MEASURING QUALITY IN EMS

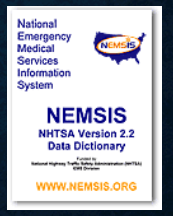
Since 2001

- Three national agencies: NASEMSO, HRSA MCHB and NHTSA
  - Really smart people
- Working to develop a national database
- Establish reliable & performance-based outcome measures
- Measure EMS quality of care

MEASURING QUALITY IN EMS

- 2003
  - Created data dictionary of 400 elements





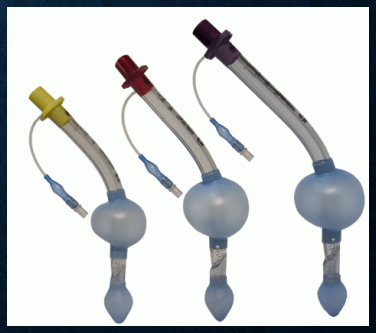
KEEP IT SIMPLE

If you can figure out just one thing each year, that's pretty good

TWO THINGS YOU MIGHT WANT TO LOOK AT

What happens when

- You put on mechanical CPR devices
- Blind-insertion Supraglottic Airways



TWO GOOD CASE STUDIES

Five-fold way to EMS problem-solving

- Identify a problem
- Throw something at it
- Close our eyes
- Hope it gets better
- Don't bother to check and see if it actually works

MECHANICAL CPR

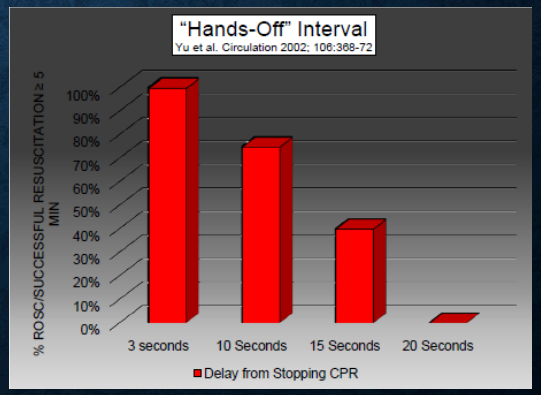
The reason these came about

- CPR hard to do well
  - Many of us have gone to highly choreographed 'pit crew' CPR
- Studies demonstrate no benefit
  - Mechanical CPR versus manual CPR (when its done well)
- Many systems have chosen to use these devices
  - Especially to ensure high quality CPR & provider safety
    - Patient 'packaging' and transport

THE SCIENCE

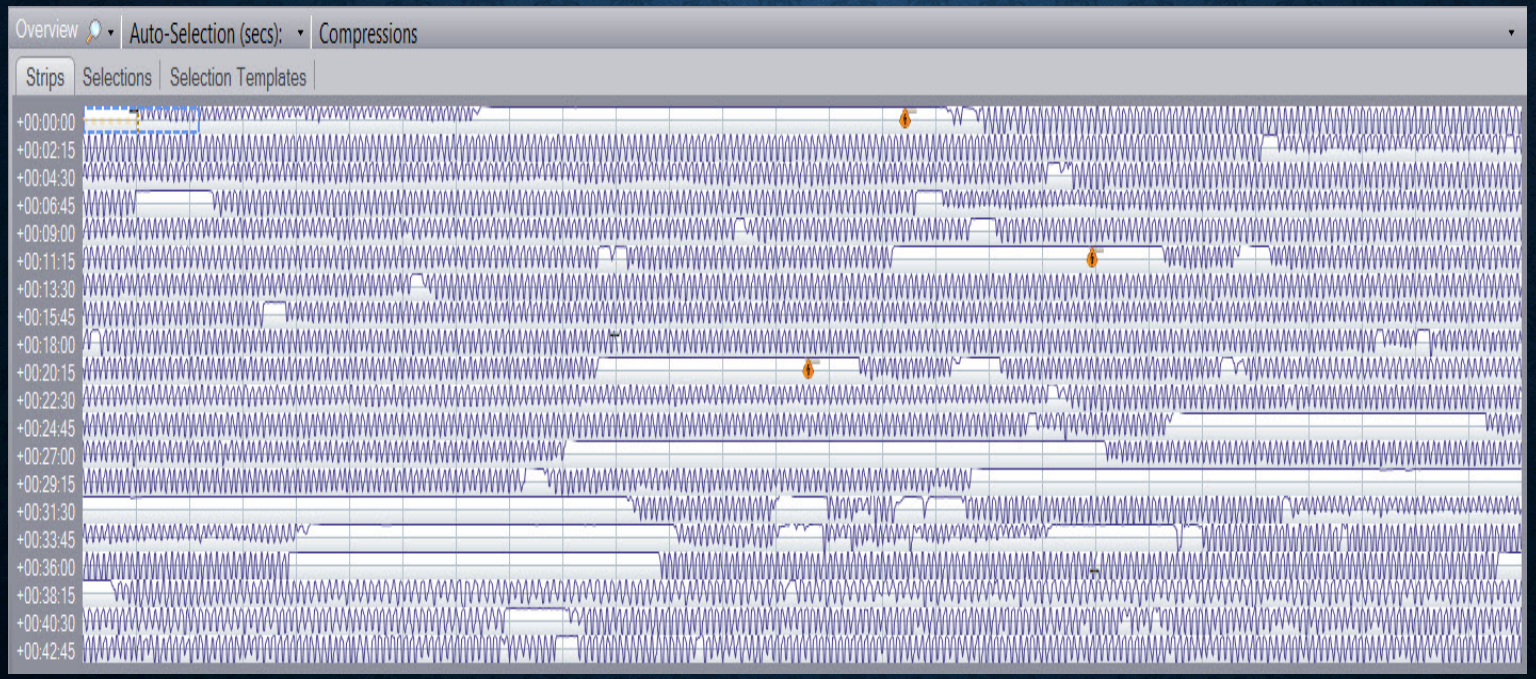
Optimizing 'time on chest' (CCF) is good and pauses are bad

- Goal is to is decrease both the frequency and length of pauses
- 30-minute resuscitation (1800 seconds)
- Use a 10-second pause as your baseline
- Pause just once > 15 seconds (0.8% of your entire 1800 second resuscitation)
- Survival decreases by about 50%



CPR ANALYTICS

65 y/o female witnessed cardiac arrest



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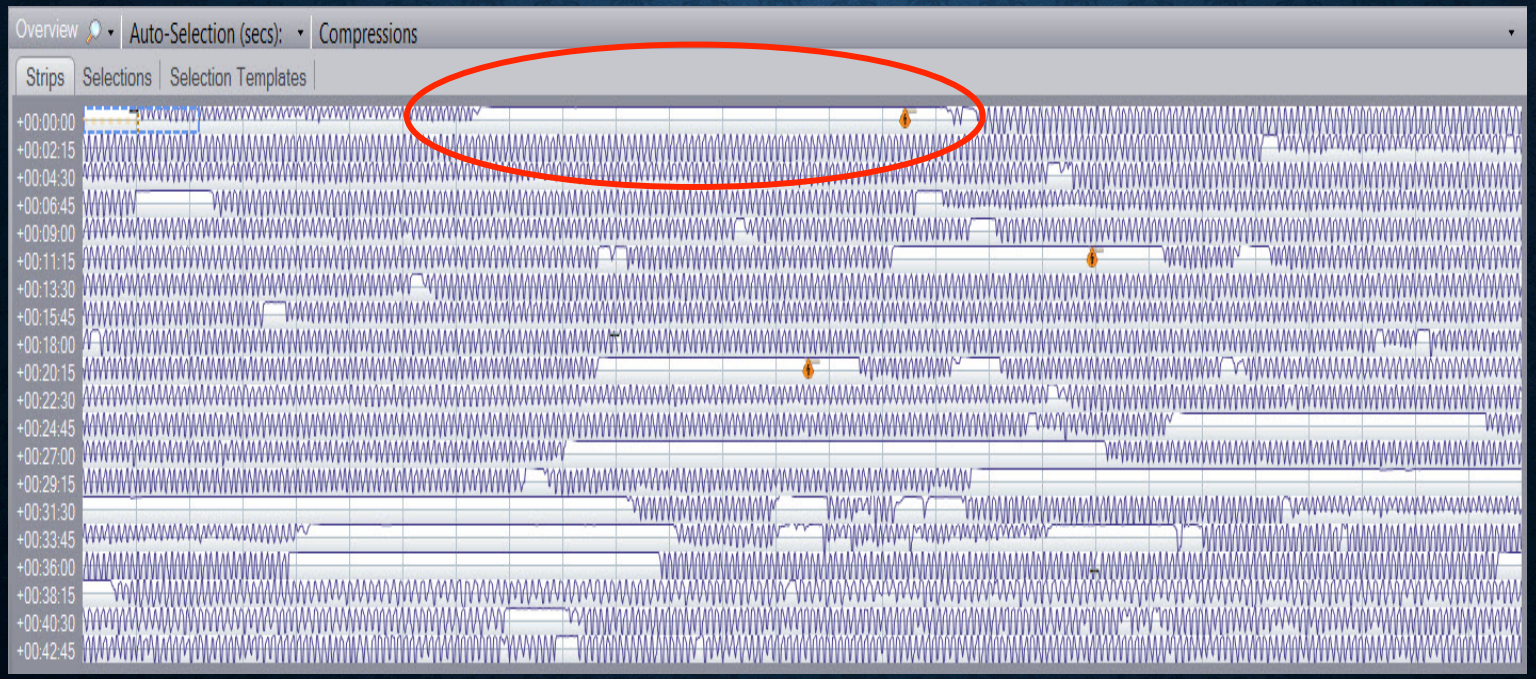
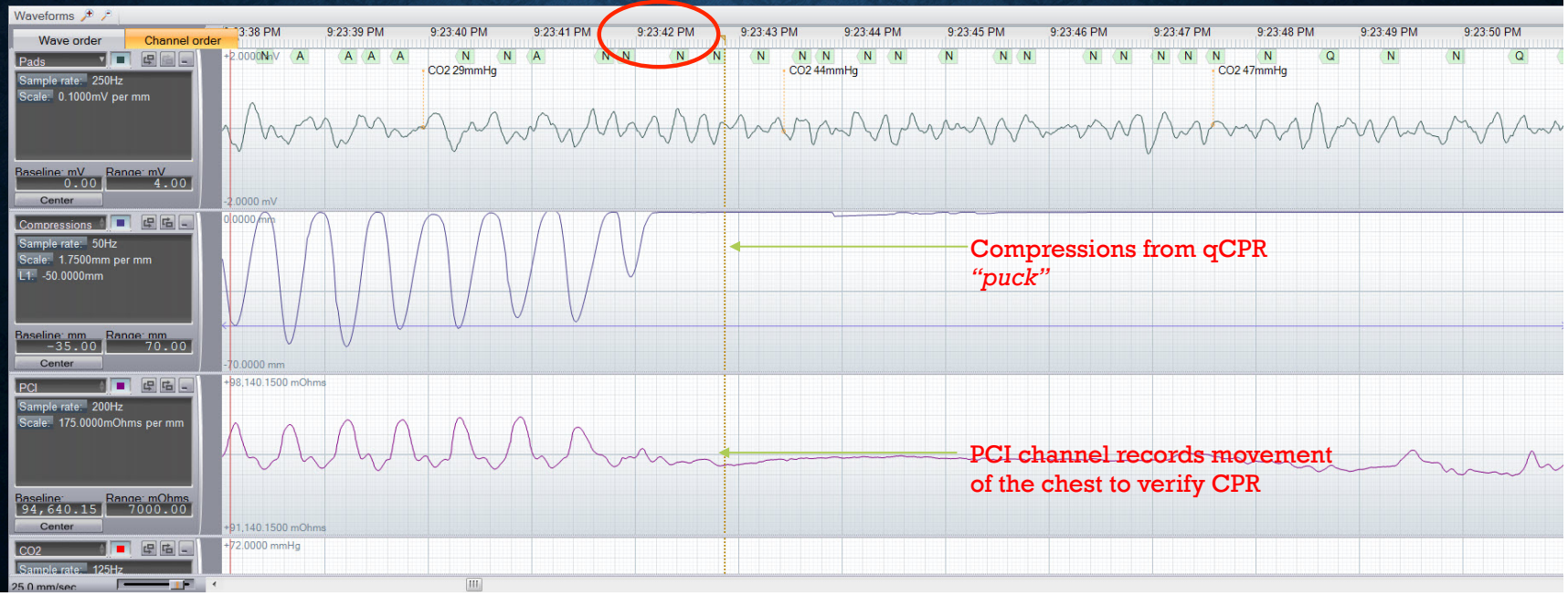


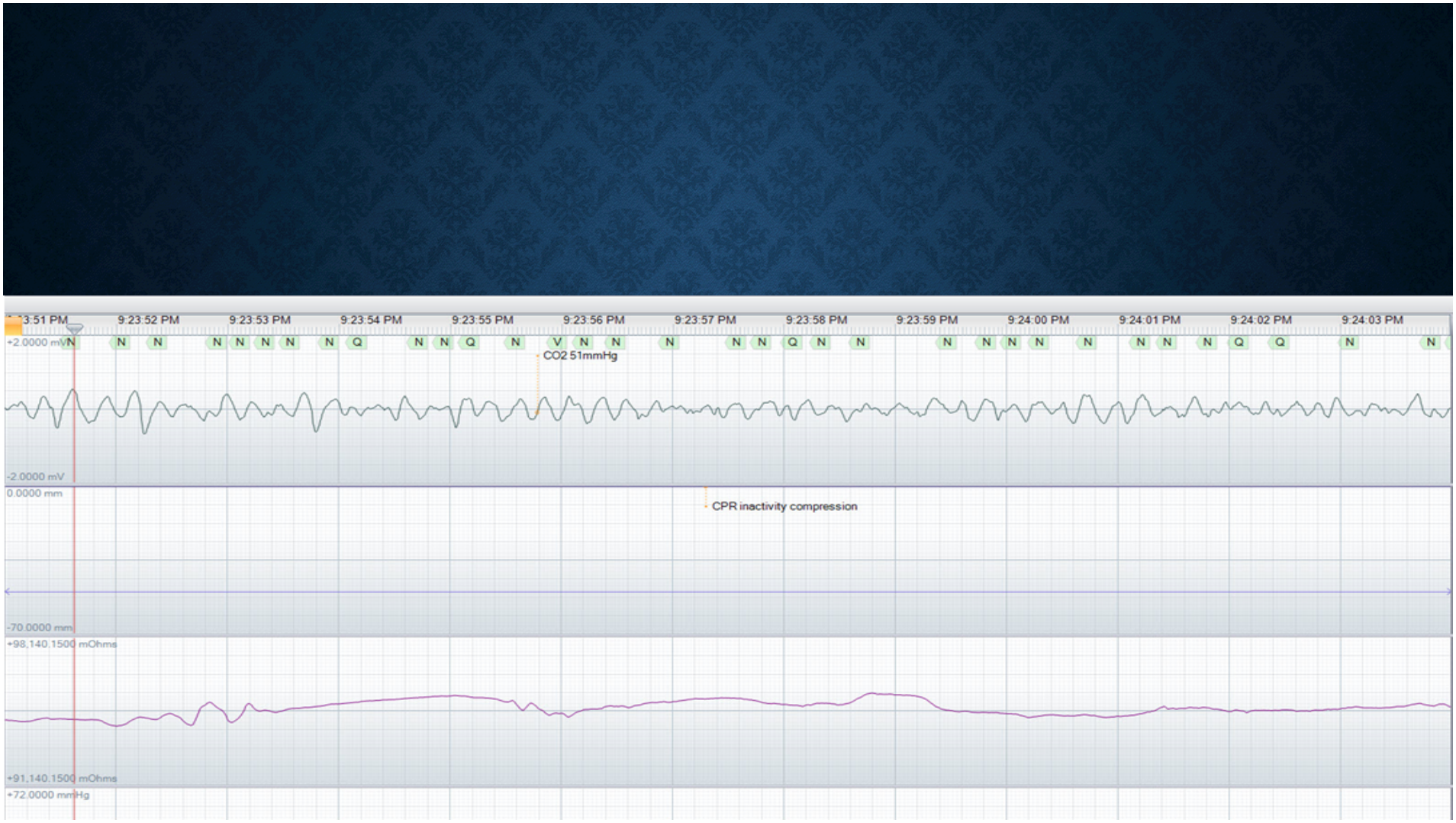
Focus on placement of the device (LUCAS)

Measure the transition from

- Stop manual CPR to placement of mechanical CPR device

9:23:42 Stop CPR




9:23:51 PM
9:23:52 PM
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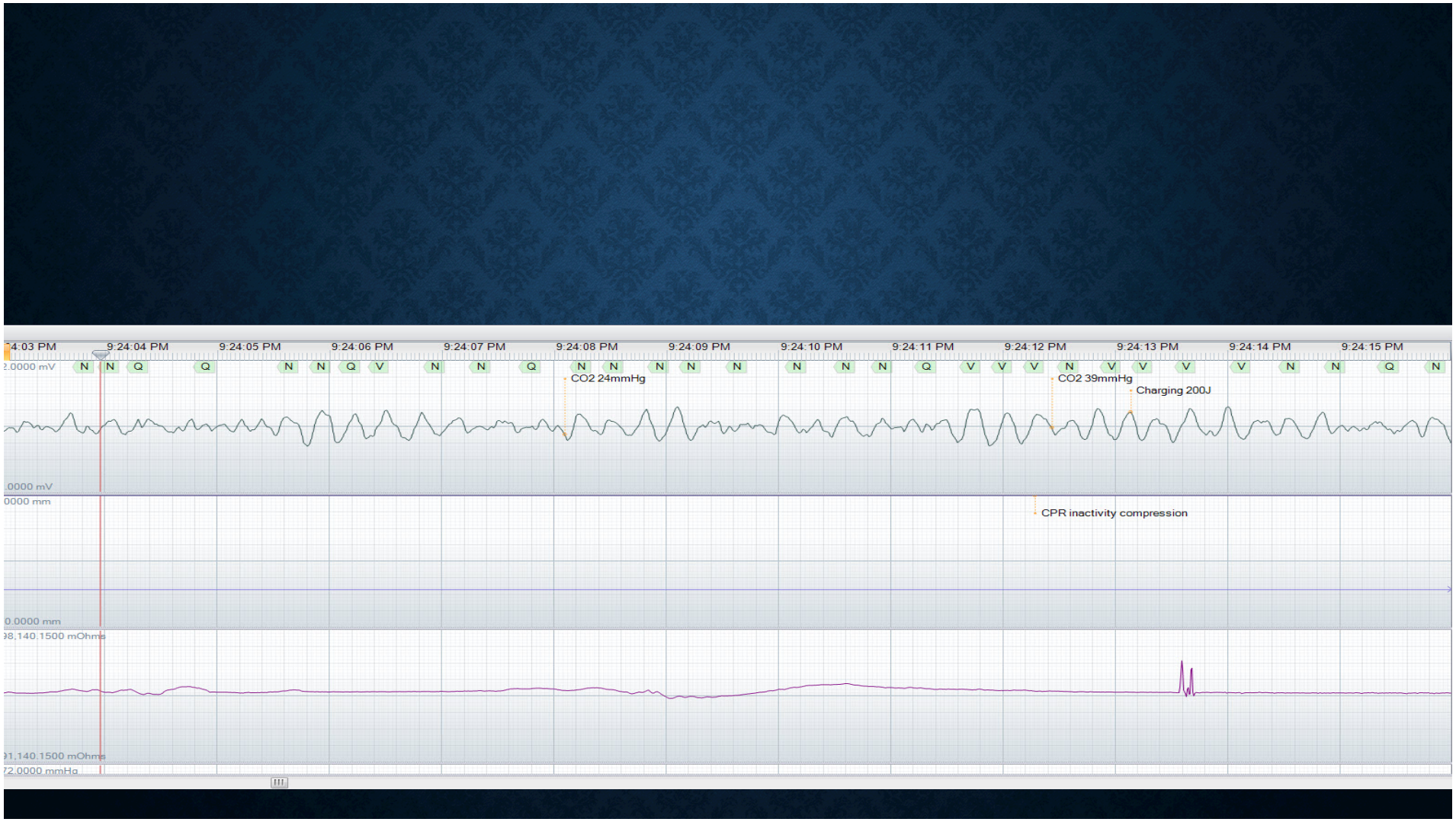
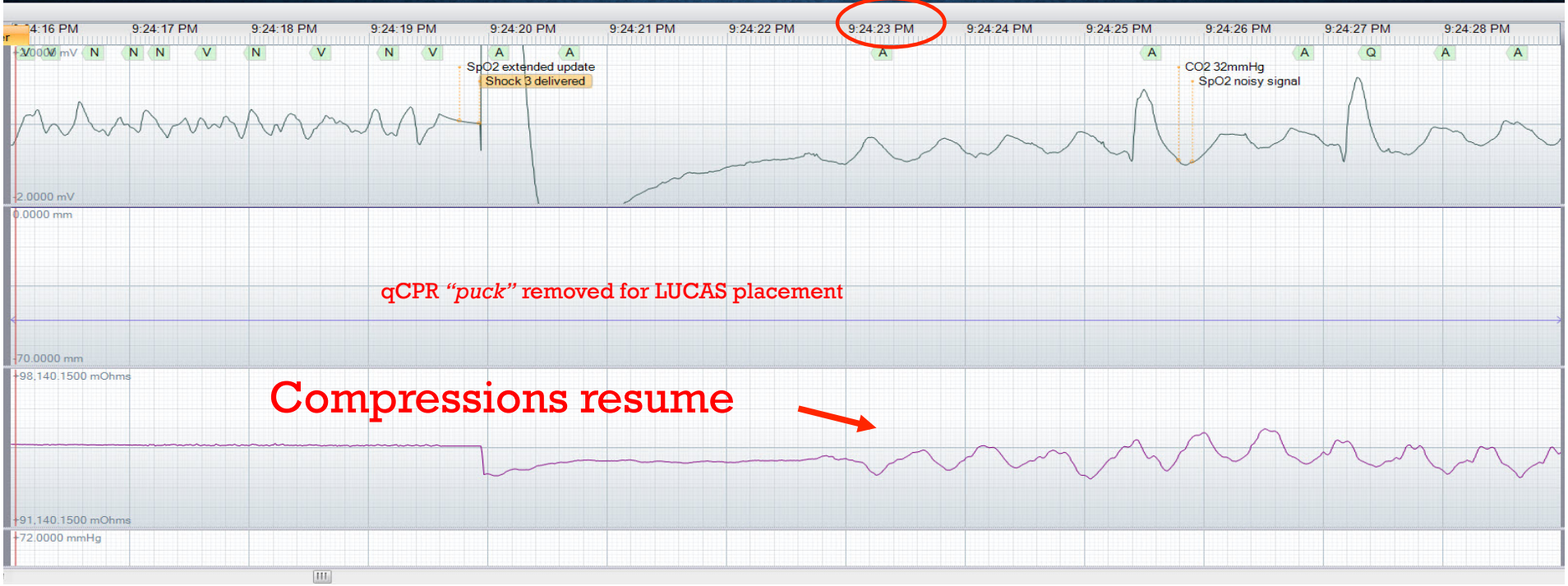
9:23:56 PM
9:23:57 PM
9:23:58 PM
9:23:59 PM
9:24:00 PM
9:24:01 PM
9:24:02 PM
9:24:03 PM
+2.0000 mV
-2.0000 mV
CO2 51mmHg
0.0000 mm
-70.0000 mm
CPR inactivity compression
+98,140.1500 mOhms
+91,140.1500 mOhms
+72.0000 mmHg


9:24:03 PM
9:24:04 PM
9:24:05 PM
9:24:06 PM
9:24:07 PM
9:24:08 PM
9:24:09 PM
9:24:10 PM
9:24:11 PM
9:24:12 PM
9:24:13 PM
9:24:14 PM
9:24:15 PM
CO2 24mmHg
CO2 39mmHg
Charging 200J
CPR inactivity compression

Defibrillation

CPR resumes @ *9:24:23*

40-second interruption in CPR

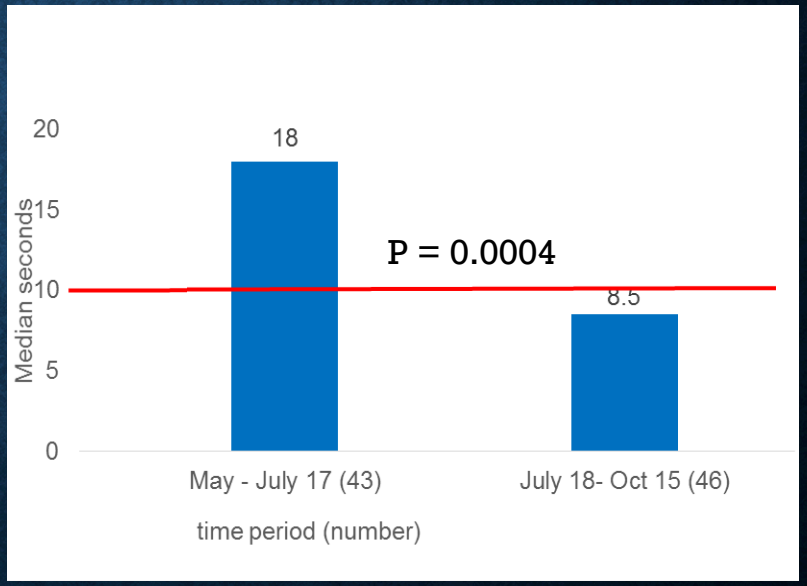


STUDY

- May 1, 2015 – July 17, 2015 – 117 worked cardiac arrests
  - 43 had Lucas placement
- July 17 – Training Session on proper Lucas placement
- July 18, 2015 – October 15, 2015 – 173 worked cardiac arrests
  - 46 had Lucas placement

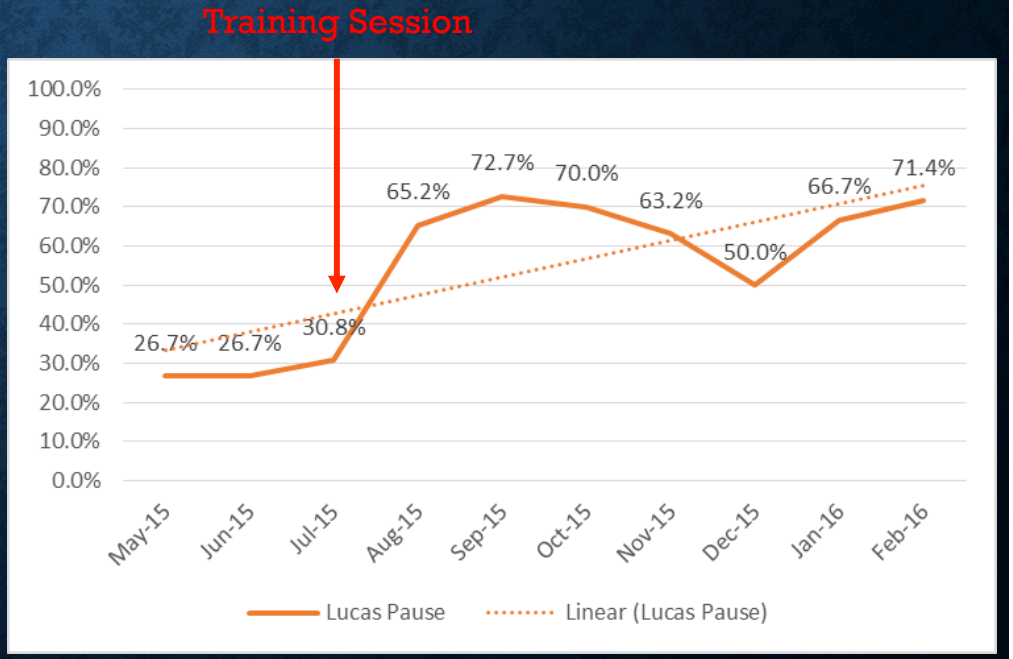
RESULTS

- Statistically significant decrease in median time to LUCAS placement post-intervention



ONGOING RESULTS

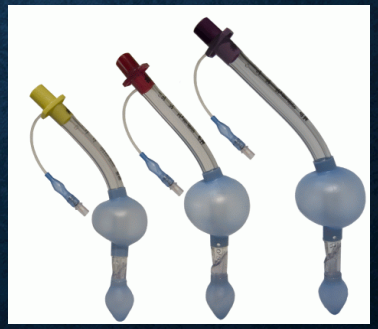
- Percent of Lucas placements < 10-seconds



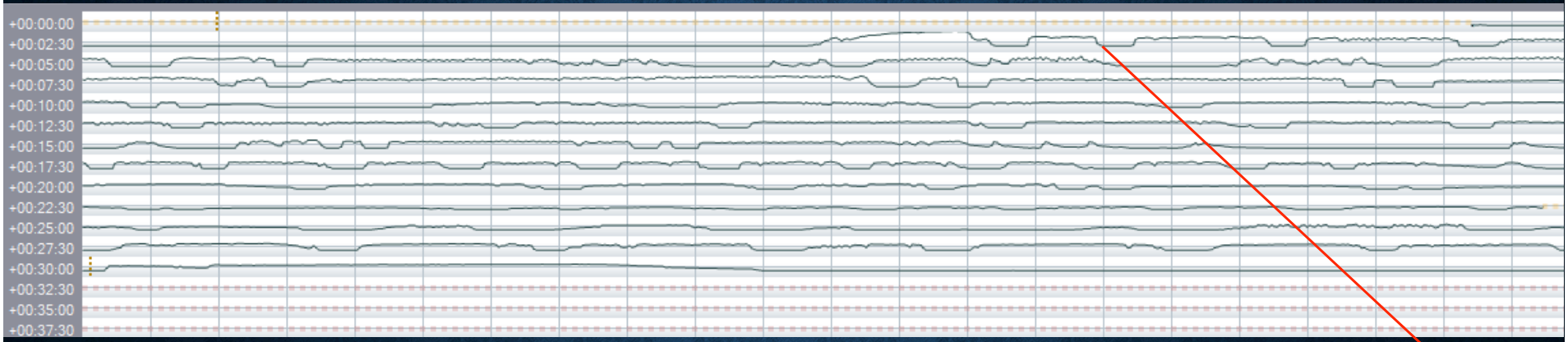
SO WHAT ABOUT BLIND INSERTION DEVICES?

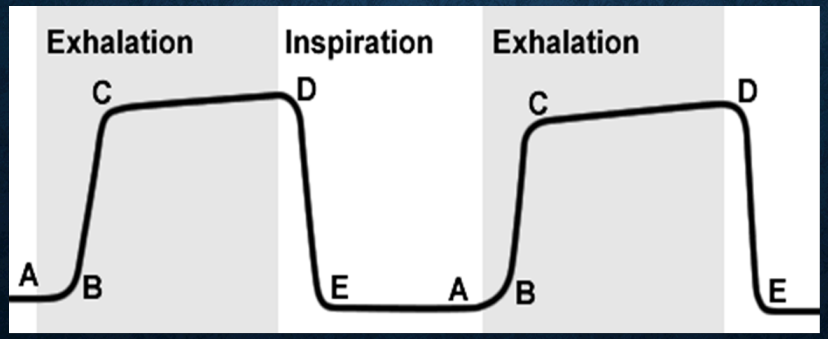
Why we moved to them

- Literature demonstrates a 25% rate of unrecognized misplaced endotracheal tubes
- Direct laryngoscopic endotracheal intubation during CPR
  - Decreases CCF or % time-on-chest
  - Increases the length of pauses



CAPNOGRAPHY IN CARDIAC ARREST

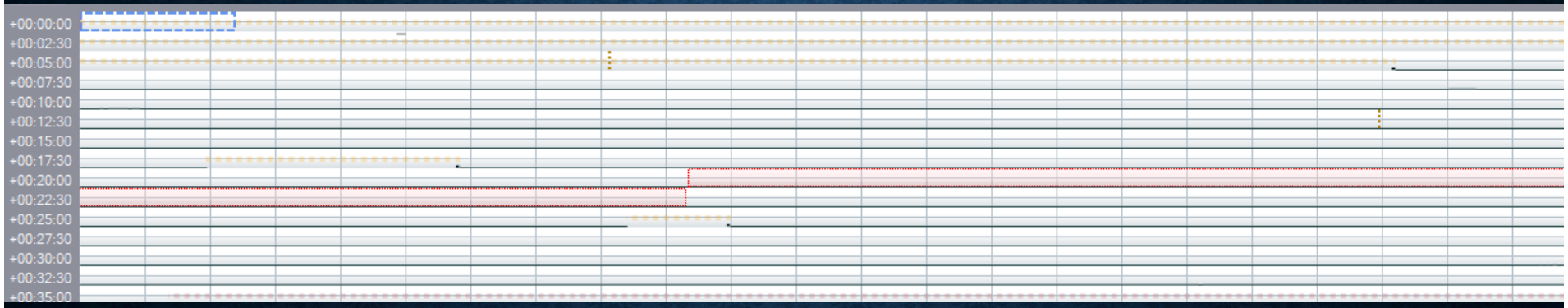




http://airwayeducation.homestead.com/Capnography.html

Phases of ventilation:
A-B: beginning of exhalation
B-C: expiratory upstroke
C-D: alveolar plateau
D-E: inspiratory downstroke
E-A: inspiration
D: end-tidal CO_2

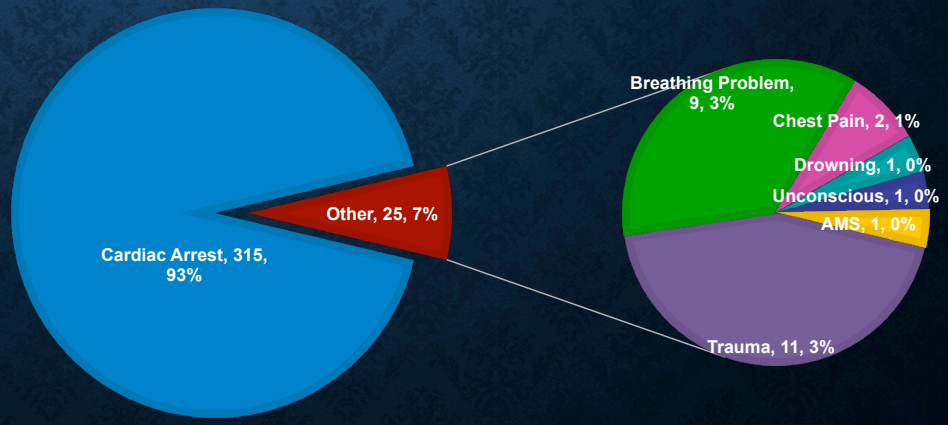
FLAT-LINE (ETCO2 = 0)



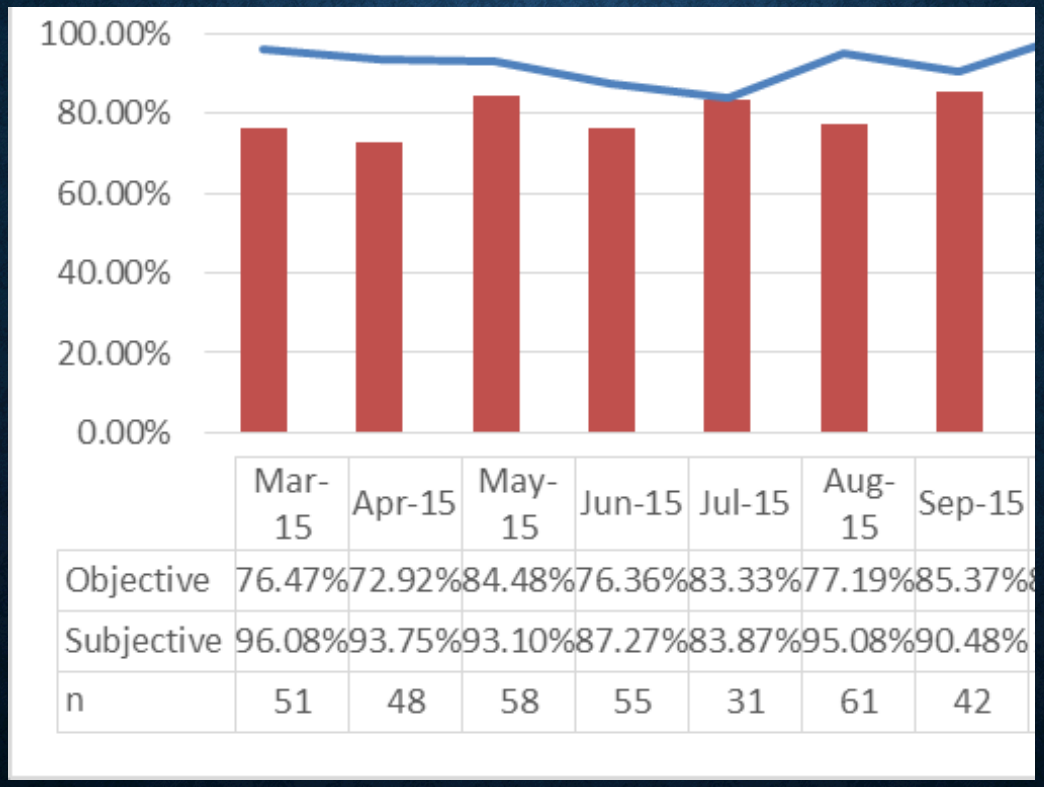
STUDY

March 1 – September 30, 2015

- 340 King tube placements
- 1 without detailed data → 339-cases for analysis
  - 328: 1-attempt
  - 10: 2-attempts
  - 3-attempts



RESULTS



	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15
Objective	76.47%	72.92%	84.48%	76.36%	83.33%	77.19%	85.37%
Subjective	96.08%	93.75%	93.10%	87.27%	83.87%	95.08%	90.48%
n	51	48	58	55	31	61	42

RESULTS

Out of total 339 King placements

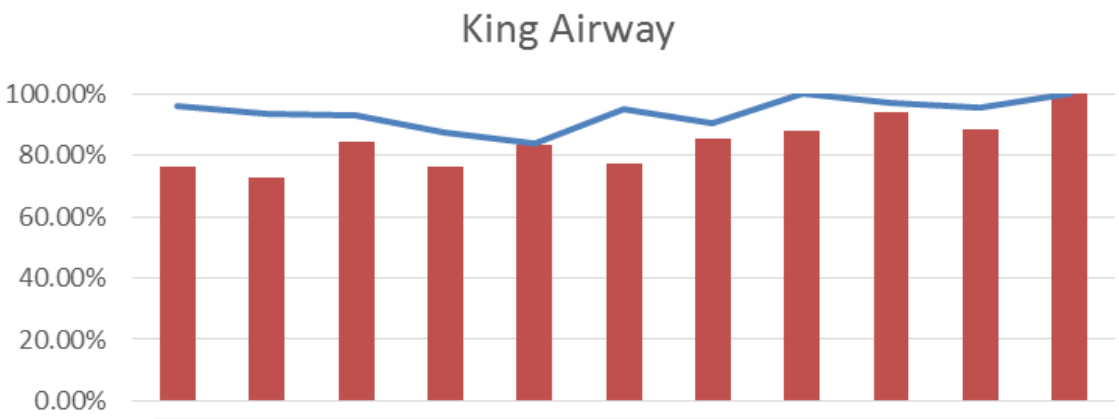
- Misplaced (ETCO2 = 0) in 19.4%
- Unrecognized in 13.9%

WHAT'S GOING ON

- Flatline EtCO2

- EtCO2 device clog

ONGOING RESULTS



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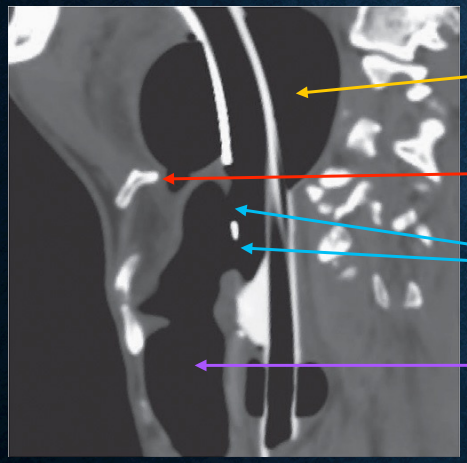
Subjective	96.08%	93.75%	93.10%	87.27%	83.87%	95.08%	90.48%	100.00	97.06%	95.56%	100.00
n	51	48	58	55	31	61	42	42	34	45	8

WHAT'S A MISPLACED KING ANYWAY?



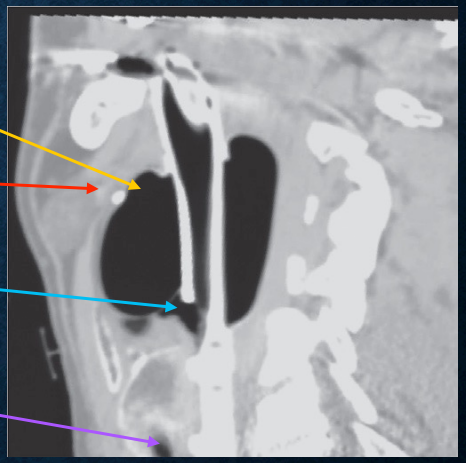
Optimal position above hyoid bone

Oropharyngeal balloon

Hyoid

Ventilatory opening

Trachea



Position distal (caudal) to hyoid bone

Schweitzer W, Spycher I, Winklhofer S, et al. *J Forsensic Radiology Imaging* 2013;1:119-123.

BOTTOM LINE

- There are simple things you can measure that make a difference
- Assume nothing until you measure it
- Should we be embarrassed by these results?
  - At least we have the tools and processes in place to look and to make things better
  - Instead of just hoping we're doing a good job or
  - In the words of Dr. Julette Saussy "*putting out a lot of feel good gibberish*"
  - But here's the thing: If you think you're a whole lot better than anyone else…just remember


WE ARE
ALL D.C.