Quality Management for EMS "Beyond Chart Review"

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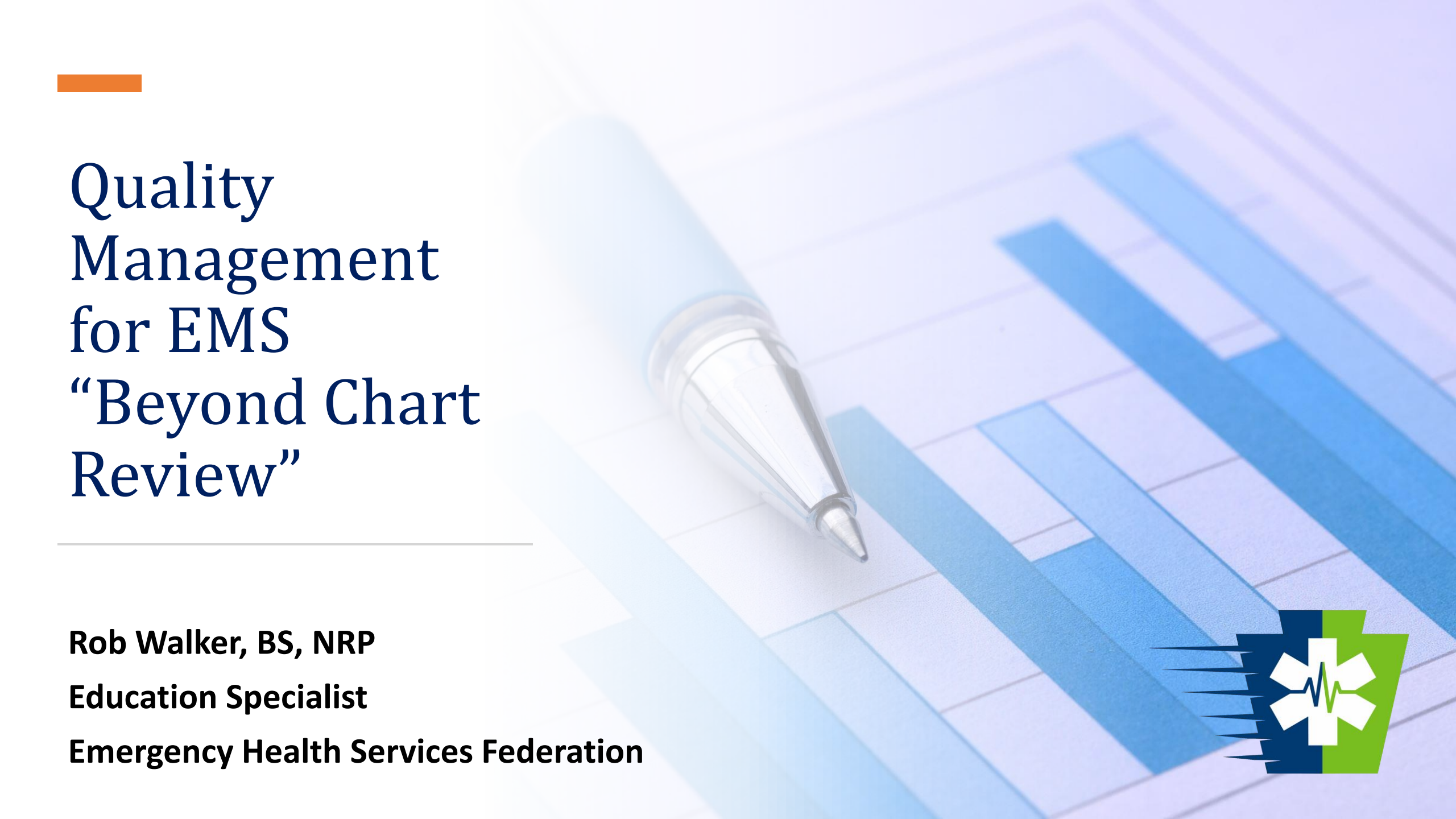


Disclosure of Conflict of Interest

Rob Walker has no financial conflicts of interest relevant to this activity.

Learning Objectives

At the conclusion of this presentation the learner will be able to:

Discuss basic EMS Quality Management strategy

Develop a factual problem statement

Implement “Plan-Do-Study-Act”

Effectively perform these QM concepts at their individual service!

“The QI officer needs to see you in his office…”

QA and QI are not the same

Quality Assurance measures individual compliance against standards.

Not administering aspirin to a patient who se condition indicates aspirin administration is a QA issue.

Quality Improvement is a Continuous Improvement Process that focuses on improving the entire system.

Having a 72% aspirin compliance rate on patients with ACS is a QI issue.

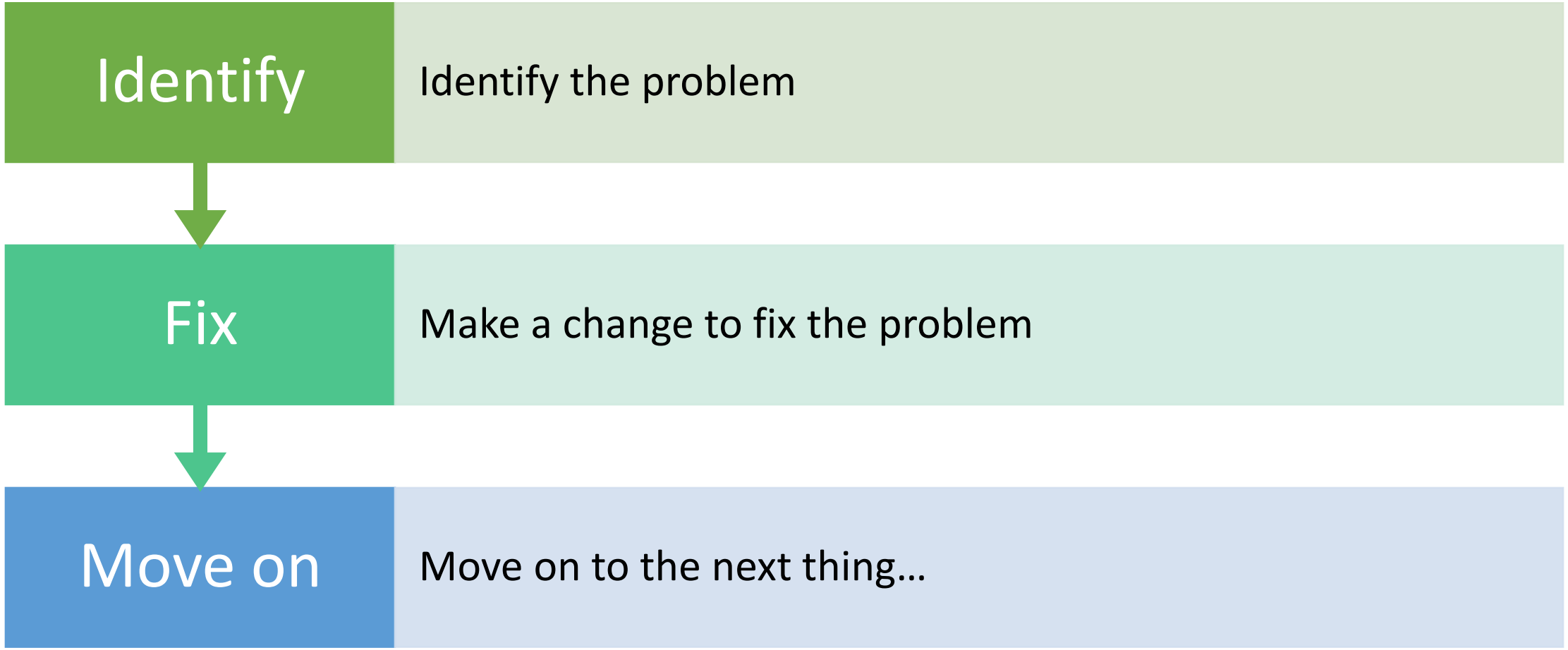
You need both!

Today, we're going beyond a simple chart review to explore Quality Management strategy to deeply probe system performance and create change initiatives that work.

Consider handwashing

Let’s begin with a little history.

The process seems simple



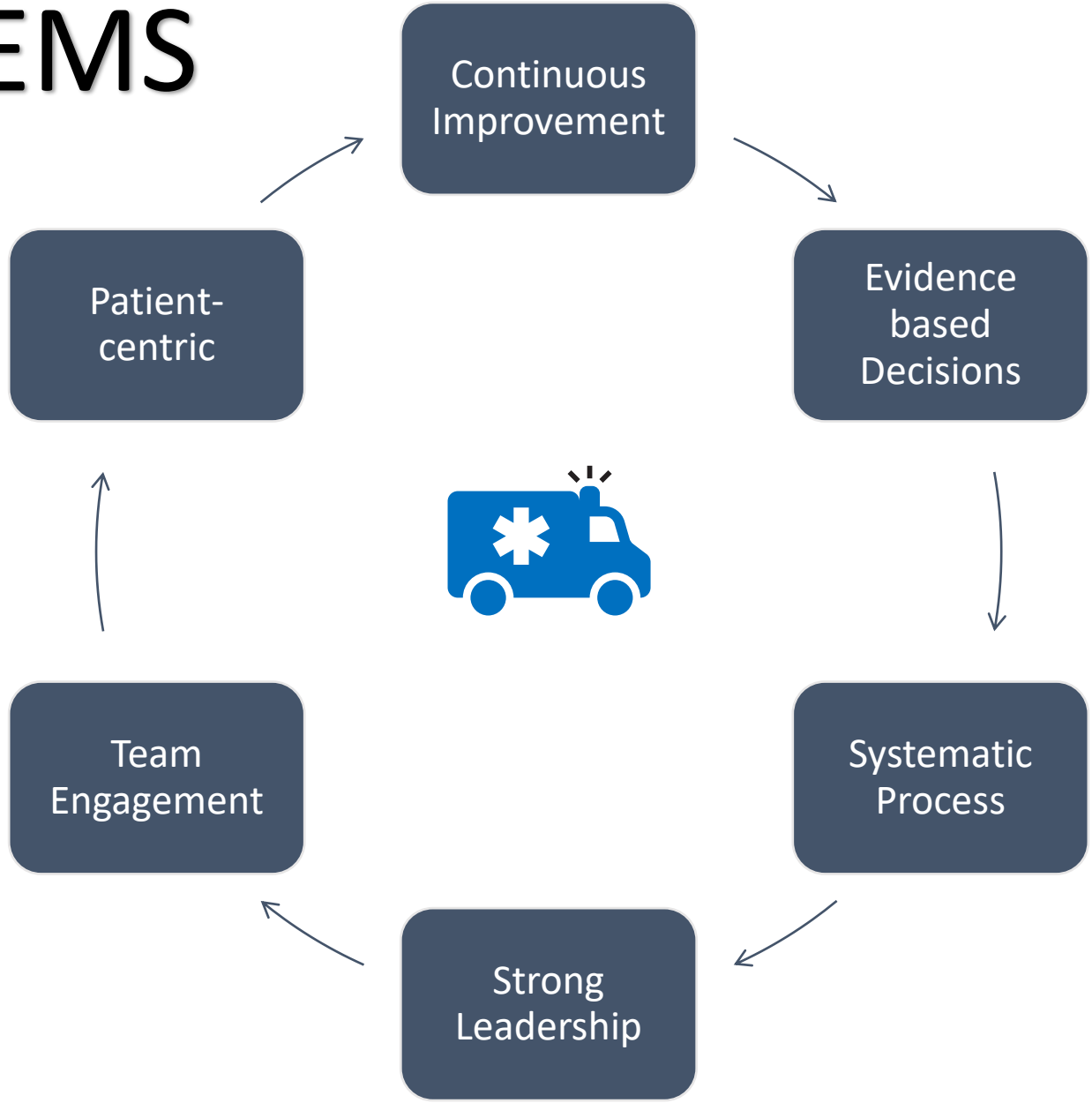
It’s not simple.

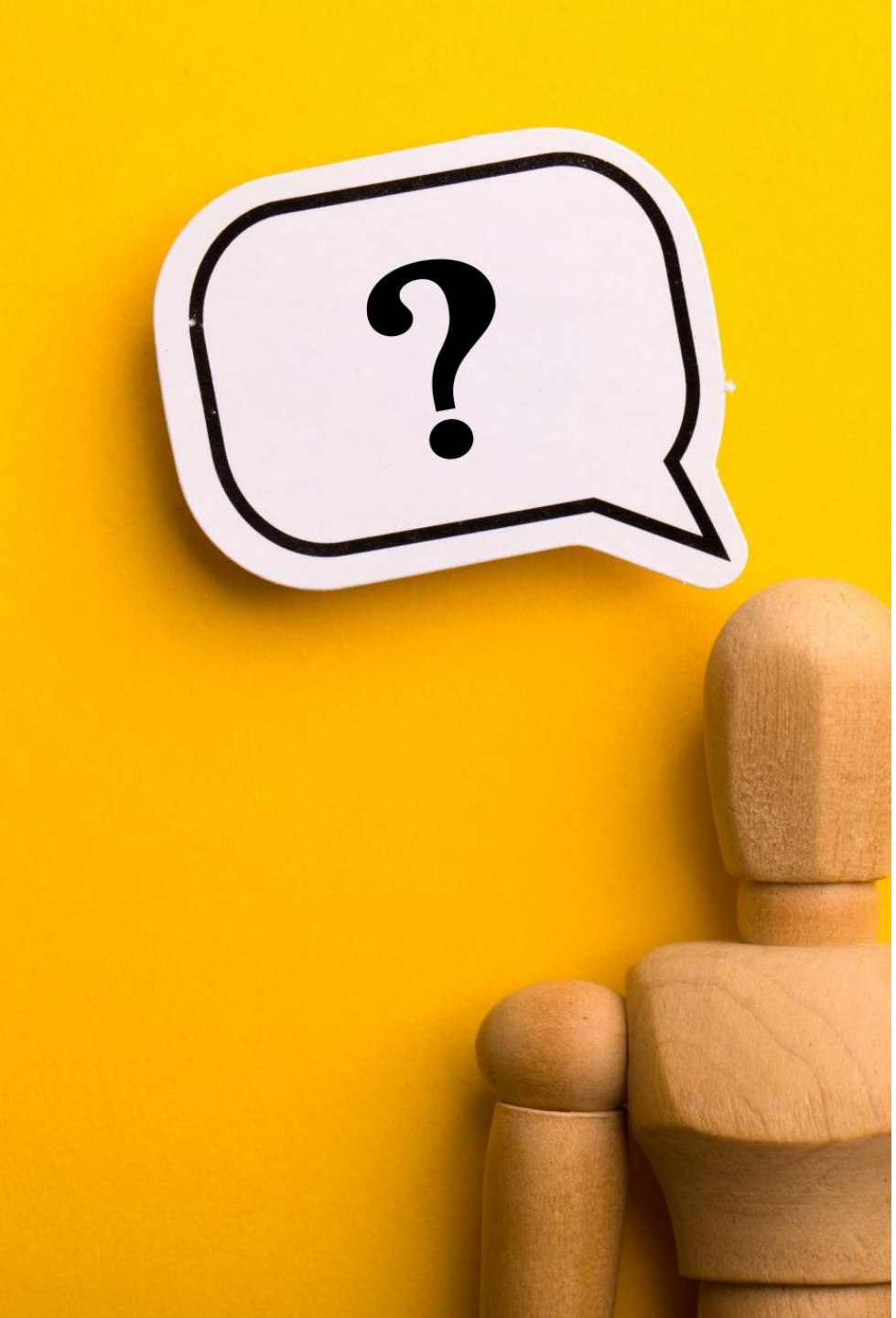
It all started with this guy…

W. Edwards Deming – The developer of what's become known as **Total Quality Management**.

- Consistency in the process
- Remove barriers to the process
- Education to accomplish the process
- Make the process the focus

TQM for EMS


Continuous Improvement
Evidence based Decisions
Systematic Process
Strong Leadership
Team Engagement
Patient-centric



Here's today's big three

Why does it matter?

What (and how) do we measure?

What do we do about it?

Why does it matter?

- QM improves operational safety
- QM improves patient outcomes
- OM improves system efficiency
- OM reduces cost and equipment waste

What do we measure?

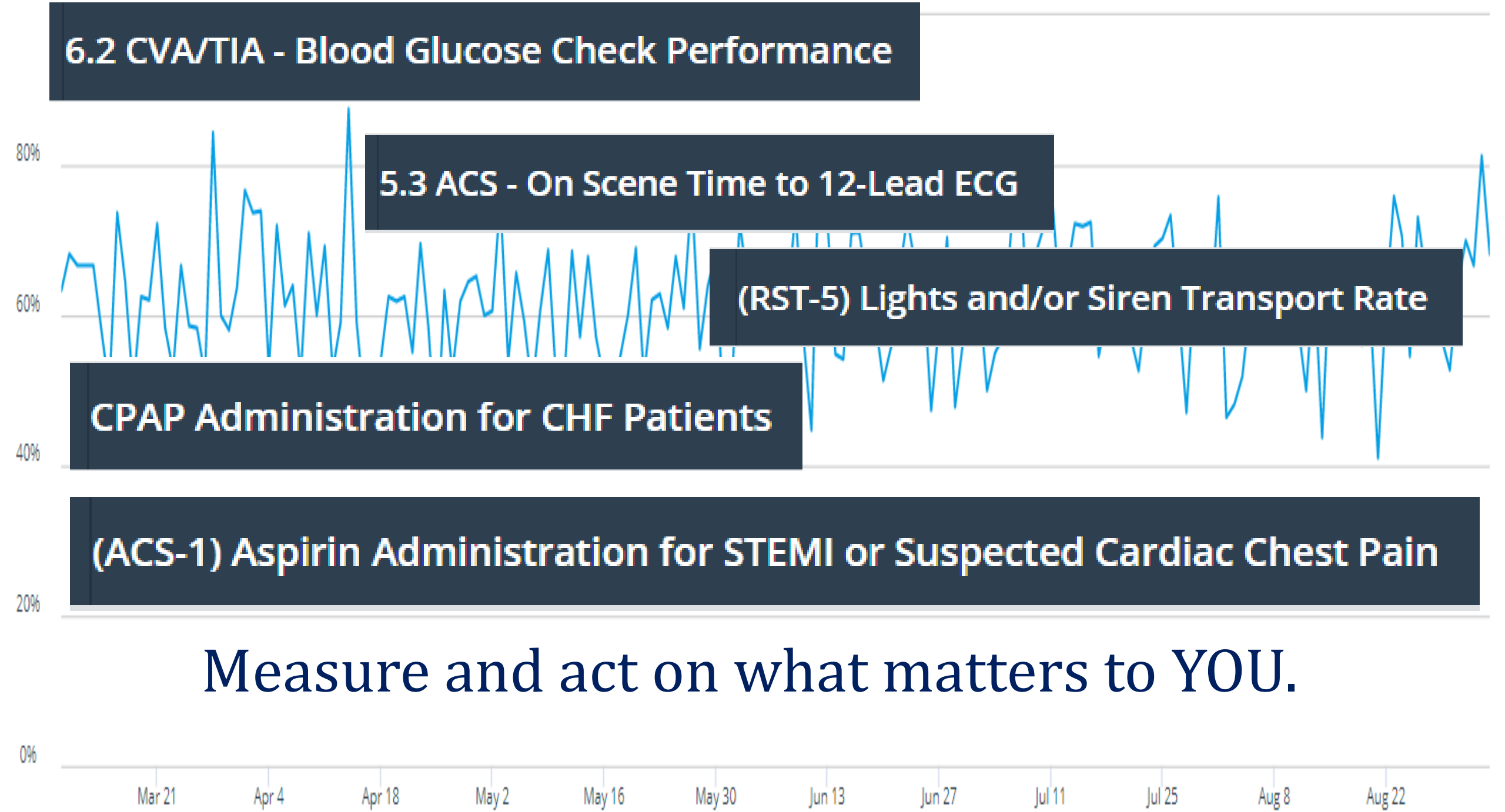
NEMSQA

National EMS Quality Alliance

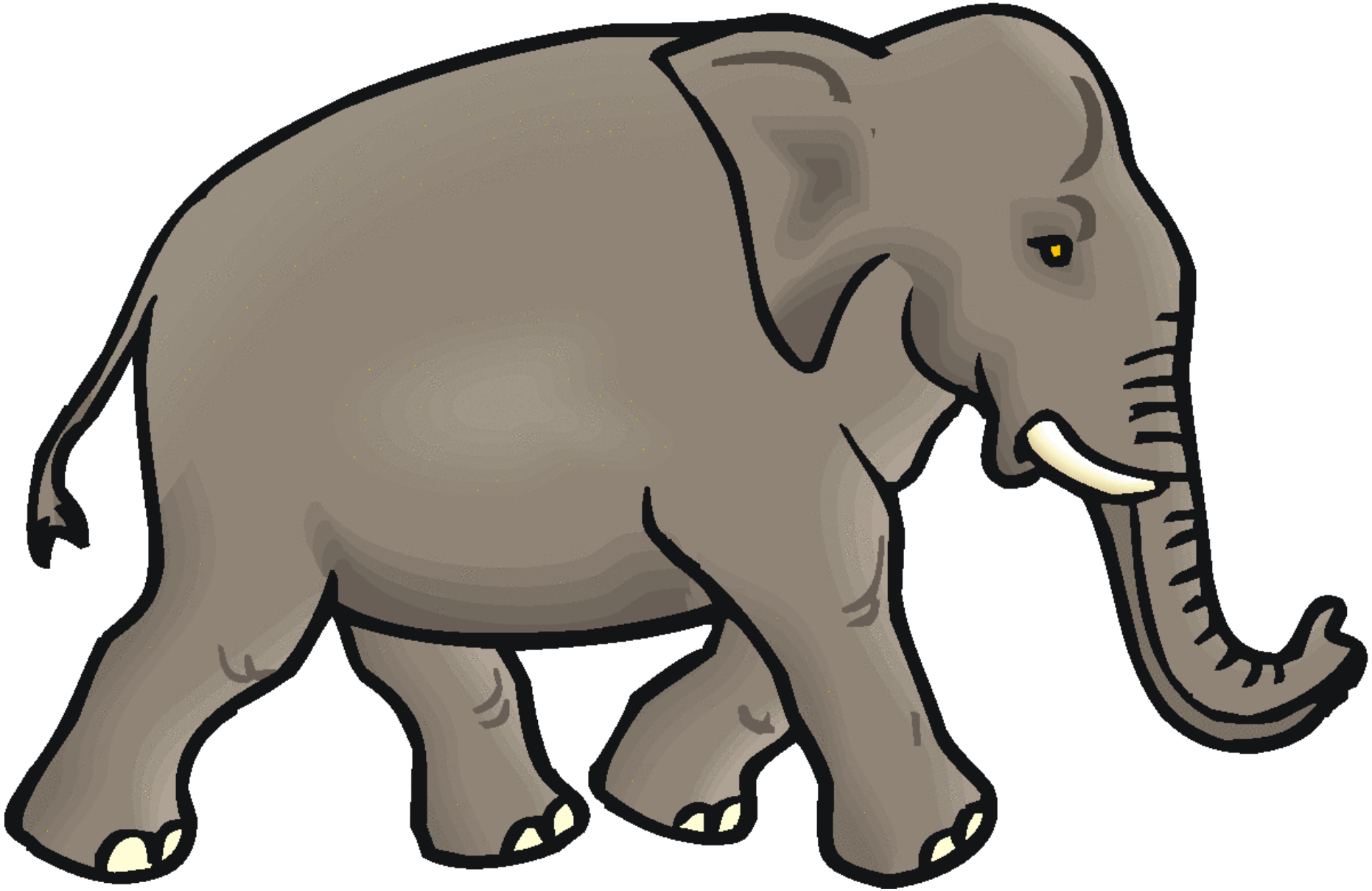
Mission:

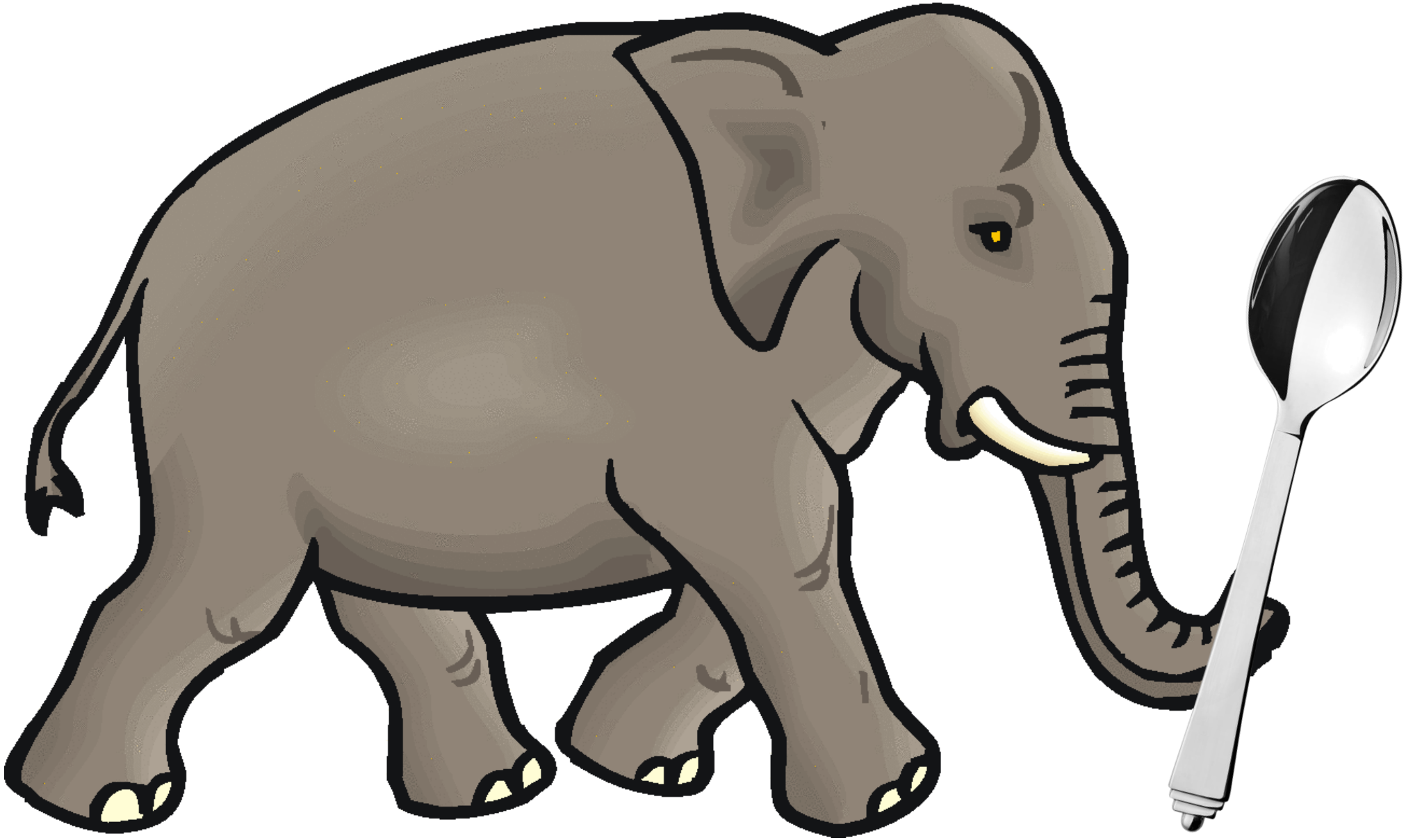
Improving patient outcomes through the collaborative development of quality measures for EMS and health systems of care.

Other groups use YOUR quality metrics…



Measure and act on what matters to YOU.





Some common patient care measures

Stroke/TIA

- Blood Glucose
- FULL Stroke Assessment (CPHSS/mFAST)

Cardiac Arrest

- Compression quality
- Airway management (SGA vs. Intubation)

Chest Pain

- ASA administration
- 12 lead from time of patient contact

Some common operational measures

Chute time	Response time	Scene time	Turnaround time
• Dispatch to responding	• 2 minutes a mile	• 20 minutes medical • 10 minutes trauma	• Arrival at hospital to return to available status

Some common individual measures

- IV success rate by medic
- ETI first pass success rate by medic
- Controlled substance administration by medic
- ALS to BLS downgrade by medic

A sidebar on data

Accurate Data

- Spelled correctly
- Correct units of measure

Authentic Data

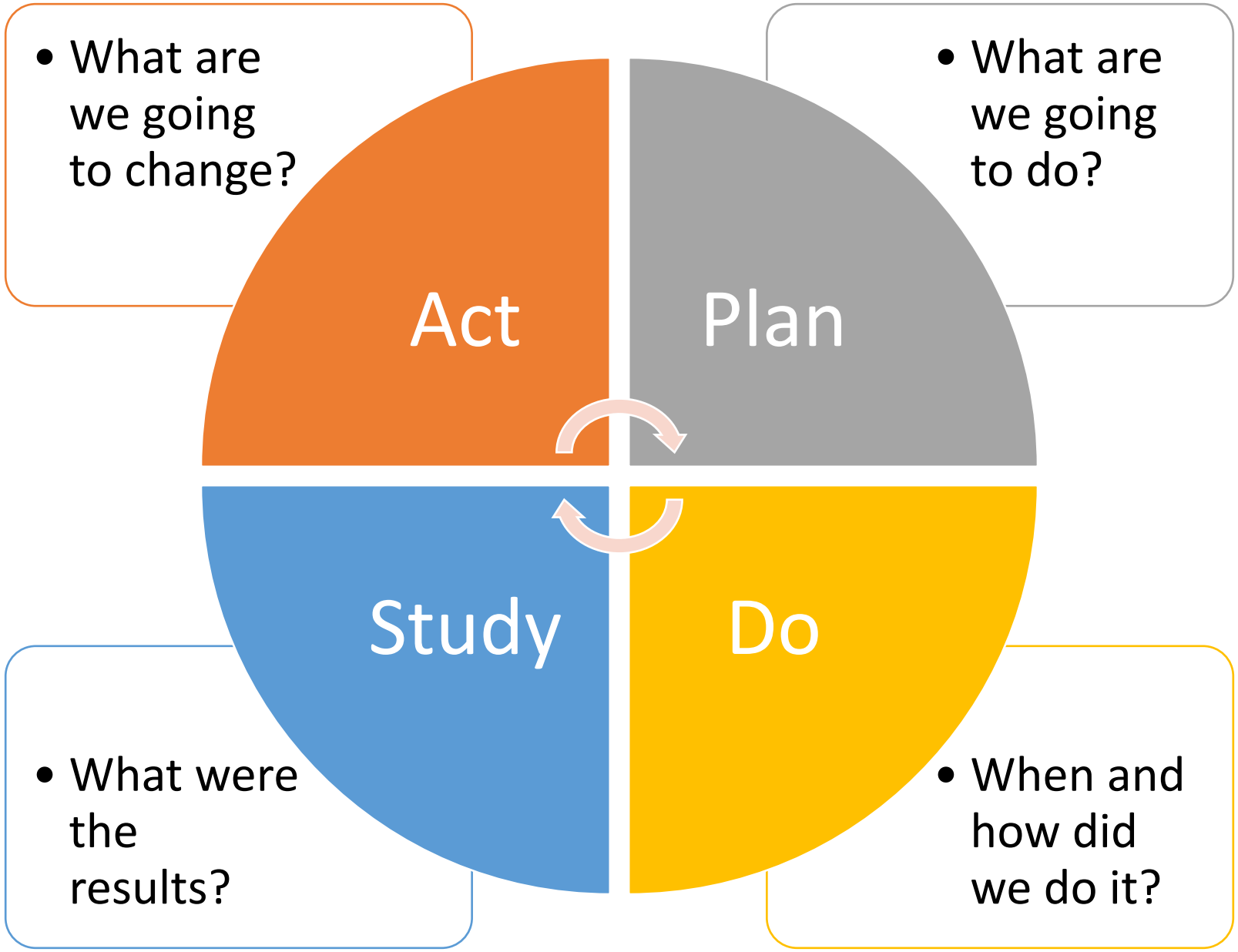
- Verified times
- Use third party source (CAD, Cardiac Monitor)

Genuine Data

- Real, truthful information

Now we know what to measure

How do we put this data to work for us?


• What are we going to change?
• What are we going to do?
Act
Plan
Study
Do
• What were the results?
• When and how did we do it?

Think about it:

If you fell off when you learned how to ride a bike, you performed a P-D-S-A cycle

A simple exercise

The chief says,

“The crews are taking way too long at the hospital. It’s taking them close to an hour to get back to available status after getting there! Fix it!”

The fix is obvious, right?

“You guys get back in service!”

Plan, Do, Check, Act.

- Plan: Get crews back in service quickly after arrival at the hospital.
- Do: Put out a memo and instruct all the crews to clear quickly.
- Study: 6 weeks later, nothing changes. In fact, some crews take longer!
- Act: What now?

Where did we go wrong?

Create a problem statement

It must be a real, evidence-based problem.

Must be concise in scope.

The problem statement can’t assign fault, assume a cause or presume a solution prior to investigation.

The “5 Whys” can get us there

To determine the cause of a problem, ask “Why?”

Often asking why five times can get us to the root of the problem.

The ambulance was out of service.

Why?

It was out of gas.

Why?

It wasn’t filled at the end of the last shift

Why?

We don’t enforce the “return with a full tank” policy

The problem was stated incorrectly.

“The crews are taking way too long at the hospital. It’s taking them close to an hour to get back to available status after getting there! Fix it!”

A factual, evidence-based problem statement can be written as:

“We are failing in our efforts to provide coverage to our primary districts due to extended turnaround delay. Failure to provide coverage may adversely affect patient outcome, decrease satisfaction and reduce public confidence. The root cause of this problem is unknown, therefor the cost and process of correction is unknown.”

Investigation revealed multiple “Whys”

There were frequent delays in assigning rooms at the ED.

Crews had to travel 20 minutes before arriving back in first due.

Failure to status with CAD correctly.

Crews perceived the only time they could take a break was if they stretched “at hospital” time.

Lots of fraternization on the hospital ED ramp.

Fixing this problem was multifaceted

- Education on correctly using CAD status.
- Discussions with Hospital EMS liaison to work on throughput
- Increased presence of supervisor on the ramp.
- Understanding that sometimes “at hospital” time was going to be extended.
- Cultural change! (The most difficult of all)

Cardiac Arrest QM Case Study

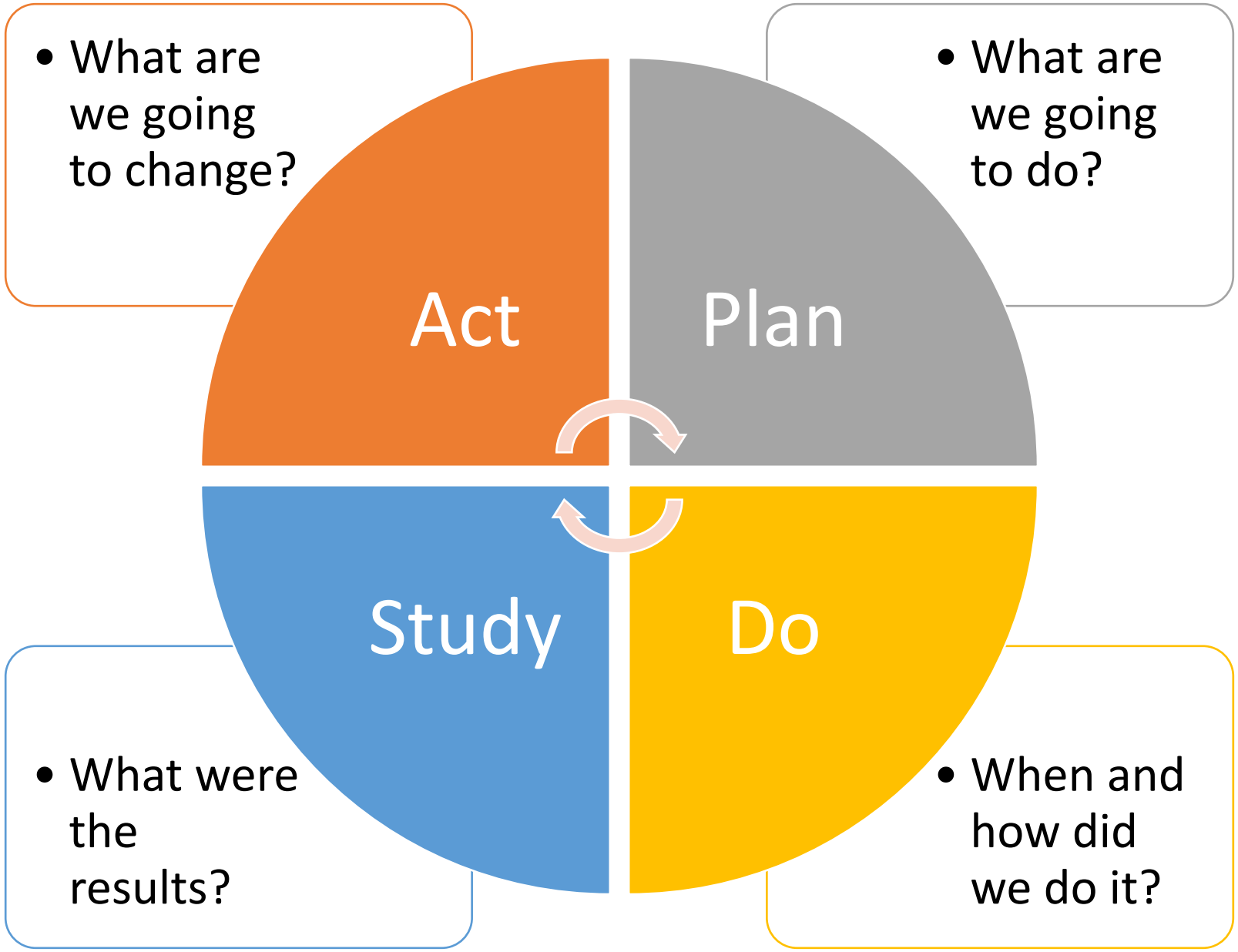
September 2018, my former agency placed Zoll X series monitors in service.

Shortly thereafter, we started to review the comprehensive CPR feedback.

And…we discovered our CPR was not as good as we thought it was.

Problem Statement

“Upon review of cardiac arrest data, we have discovered gross deficiencies in the rate, depth and overall quality of compressions and frequent CPR pauses that exceed 10 seconds. Failure to correct these deficiencies will decrease chances of survival of out of hospital cardiac arrest (OOHCA). The root cause of deficiencies is unknown, as is the cost and scope of corrective action.”


• What are we going to change?
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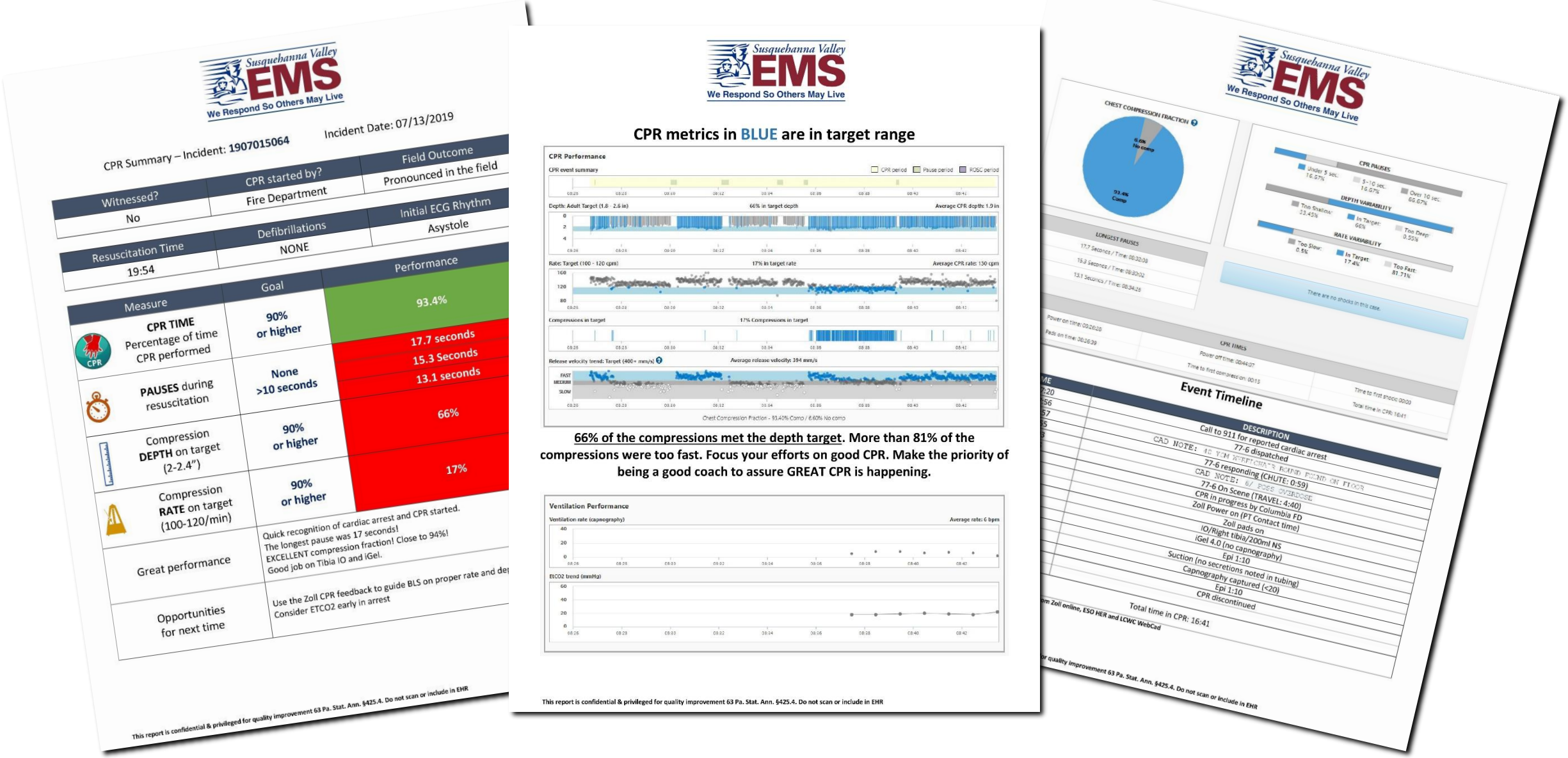
We built a set of data collection tools.



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CPR Summary – Incident: **1907015064** Incident Date: 07/13/2019

Witnessed?	CPR started by?	Field Outcome
No	Fire Department	Pronounced in the field
Resuscitation Time	**Defibrillations**	**Initial ECG Rhythm**
19:54	NONE	Asystole

Measure	Goal	Performance
CPR TIME Percentage of time CPR performed	90% or higher	93.4%
PAUSES during resuscitation	None >10 seconds	17.7 seconds 15.3 Seconds 13.1 seconds
Compression **DEPTH** on target (2-2.4")	90% or higher	66%
Compression **RATE** on target (100-120/min)	90% or higher	17%
Great performance	Quick recognition of cardiac arrest and CPR started. The longest pause was 17 seconds! EXCELLENT compression fraction! Close to 94%! Good job on Tibia IO and iGel.	
Opportunities for next time	Use the Zoll CPR feedback to guide BLS on proper rate and dep Consider ETCO2 early in arrest	

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CPR metrics in BLUE are in target range

CPR Performance

CPR event summary — CPR period / Pause period / ROSC period

Depth: Adult Target (1.8 - 2.6 in) — 66% in target depth — Average CPR depth: 1.9 in

Rate: Target (100 - 120 cpm) — 17% in target rate — Average CPR rate: 130 cpm

Compressions in target — 17% Compressions in target

Release velocity trend: Target (400+ mm/s) — Average release velocity: 394 mm/s

Chest Compression Fraction - 93.40% Comp / 6.60% No comp

66% of the compressions met the depth target. More than 81% of the compressions were too fast. Focus your efforts on good CPR. Make the priority of being a good coach to assure GREAT CPR is happening.

Ventilation Performance

Ventilation rate (capnography) — Average rate: 6 bpm

ETCO2 trend (mmHg)

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CHEST COMPRESSION FRACTION — 6.6% No comp / 93.4% Comp

CPR PAUSES — Under 5 sec: 16.67% / 5-10 sec: 16.67% / Over 10 sec: 66.67%

DEPTH VARIABILITY — Too Shallow: 33.45% / In Target: 66% / Too Deep: 0.55%

RATE VARIABILITY — Too Slow: 0.5% / In Target: 17.4% / Too Fast: 81.71%

LONGEST PAUSES — 17.7 Seconds / Time: 08:32:08; 15.3 Seconds / Time: 08:20:02; 13.1 Seconds / Time: 08:34:26

There are no shocks in this case.

Power on time: 08:26:20
Pads on time: 08:26:39

CPR TIMES — Power off time: 08:44:07; Time to first compress on: 00:15; Time to first shock: 00:00; Total time in CPR: 16:41

Event Timeline

DESCRIPTION
Call to 911 for reported cardiac arrest
77-6 dispatched
CAD NOTE: 40 YOM WITH CHEST PAIN FOUND FLOOR
77-6 responding (CHUTE: 0:59)
CAD NOTE: S/P ROSS OVERDOSE
77-6 On Scene (TRAVEL: 4:40)
CPR in progress by Columbia FD
Zoll Power on (PT Contact time)
Zoll pads on
IO/Right tibia/200ml NS
iGel 4.0 (no capnography)
Epi 1:10
Suction (no secretions noted in tubing)
Capnography captured (<20)
Epi 1:10
CPR discontinued

Total time in CPR: 16:41

...m Zoll online, ESO HER and LCWC WebCad

...r quality improvement 63 Pa. Stat. Ann. §425.4. Do not scan or include in EHR

Added metronomes set at 110 BPM to all cardiac monitors.

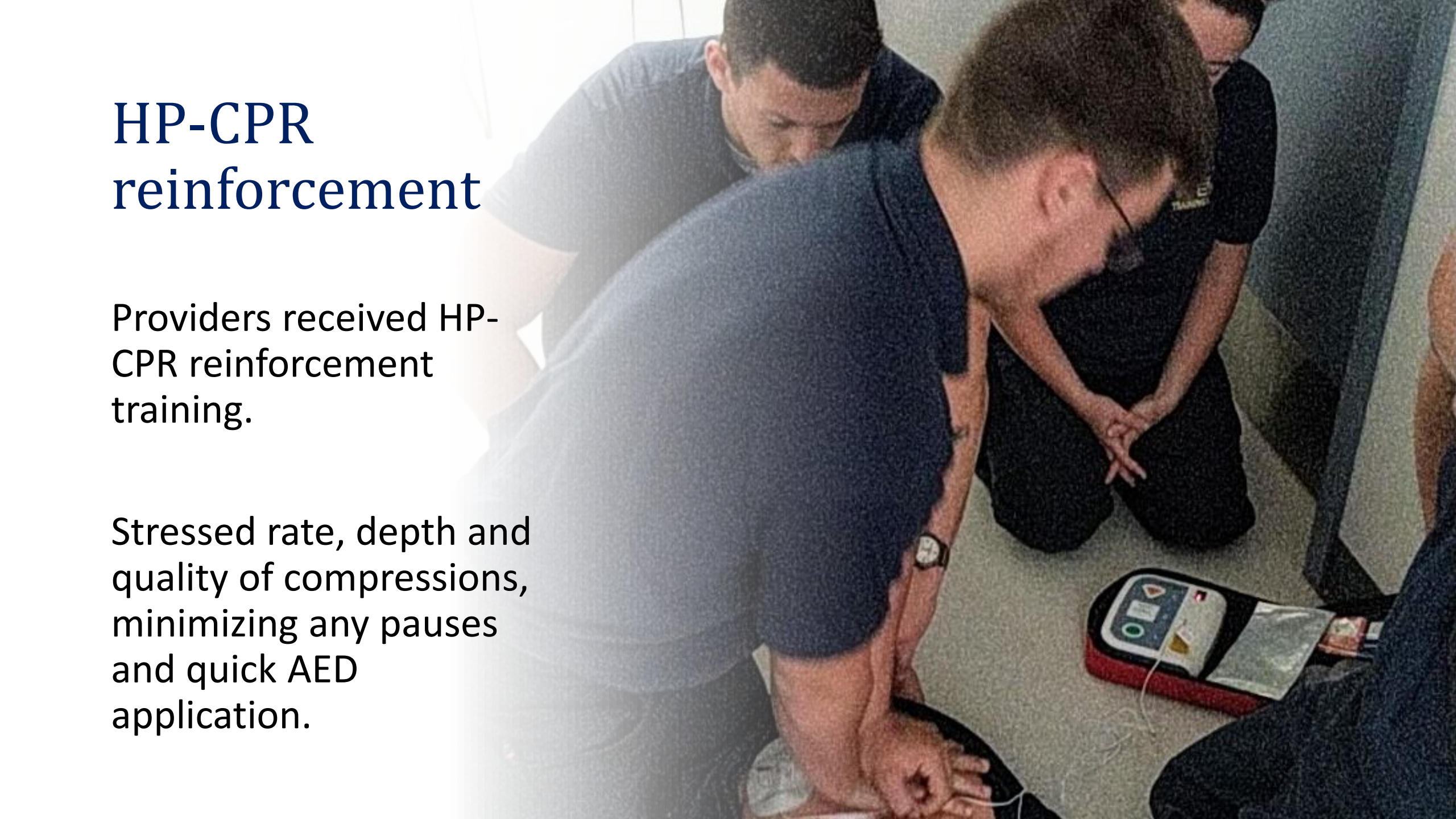
Daily 2-minute CPR challenge

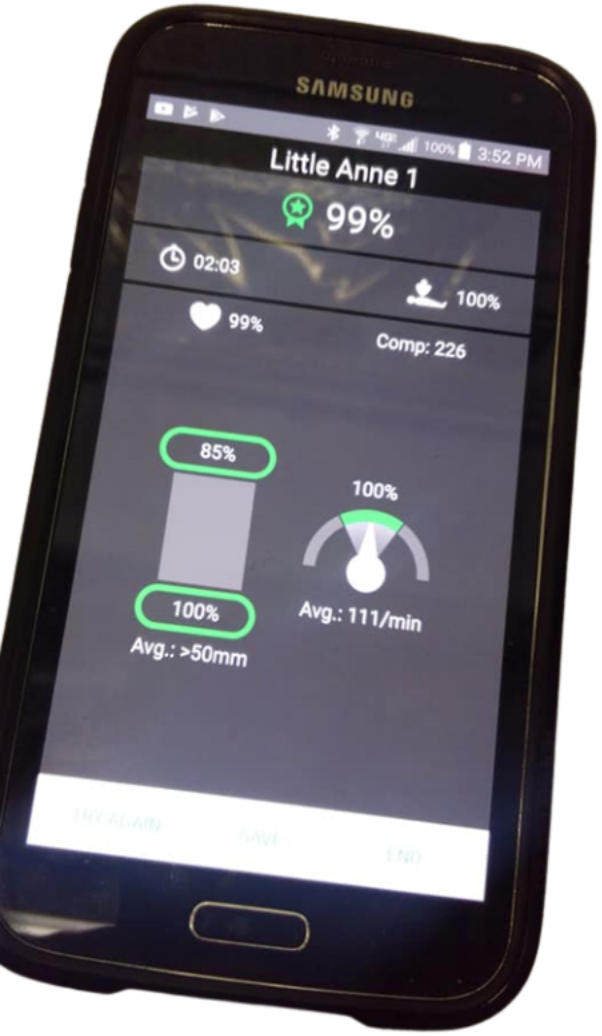
Each provider performed 2 minutes of compression only CPR each day at shift change to build muscle memory and endurance

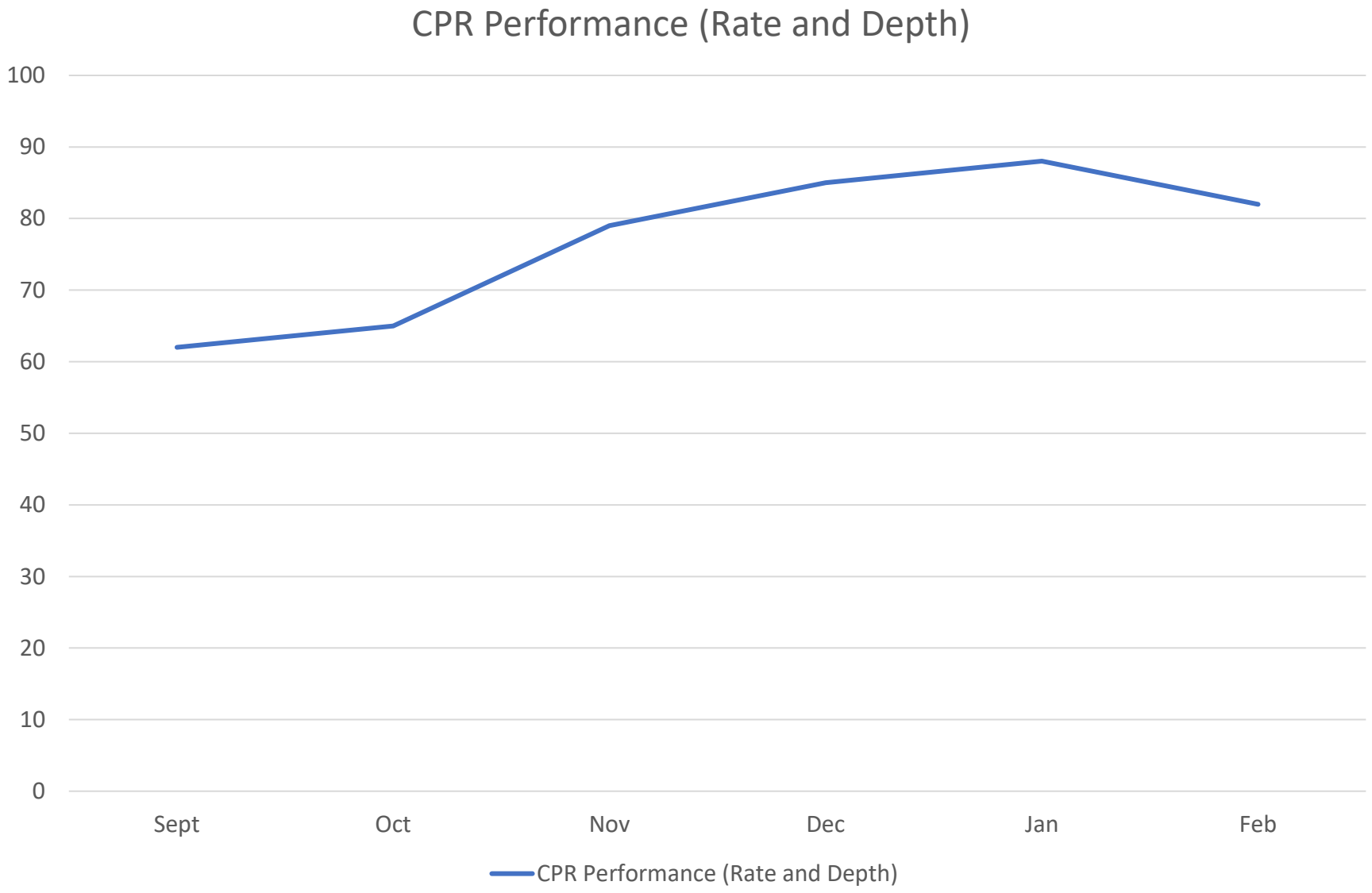
HP-CPR reinforcement

Providers received HP-CPR reinforcement training.

Stressed rate, depth and quality of compressions, minimizing any pauses and quick AED application.




SAMSUNG
3:52 PM
Little Anne 1
99%
02:03
100%
99%
Comp: 226
85%
100%
100%
Avg.: 111/min
Avg.: >50mm


CPR Performance (Rate and Depth)
100
90
80
70
60
50
40
30
20
10
0
Sept
Oct
Nov
Dec
Jan
Feb
CPR Performance (Rate and Depth)

Can YOU make improvements?

Yes, but it takes work.

The best strategy is to start small, with a singular item that can be closely monitored.

Even a small success can lead to a cascade of positive changes.

QM key takeaways

- Avoid collecting meaningless data.
- Keep the focus patient-centric.
- Be transparent with your QM initiatives
- Involve the staff with the process
- The process must be based on **system** improvement, not punishment.

References

A Leadership Guide to Quality Improvement for Emergency Medical Services (EMS)Systems. (n.d.). Retrieved from https://icsw.nhtsa.gov/people/injury/ems/leaderguide/#qitat.

Berwick DM. (1989, January 5). Continuous improvement as an ideal in health care. Retrieved from https://psnet.ahrq.gov/resources/resource/1548.

EMS Compass. (n.d.). Retrieved from https://nasemso.org/projects/ems-compass/.

Kirkwood, S. (Ed.). (2015). *Management of ambulance services*. Boston: Pearson.

Roth, R. (2005). EMS Quality Improvement Made Ridiculously Easy. Retrieved from http://www.pitt.edu/~meddir/cqi/QIlecture.pdf.

Tips from the Trenches: Making Your HP-CPR Training Program a Reality. (2017, September 1). Retrieved from http://www.resuscitationacademy.org/2017/09/01/tips-trenches-making-hp-cpr-training-program-reality/.

W. Edwards Deming. (n.d.). Retrieved from https://asq.org/about-asq/honorary-members/deming.