Building High-Performance Resuscitation Teams





Your Session Leaders and Sponsors ABC, EMS Sales Manager

Schedule

A series of hands-on experiences supported by discussions and debriefings

Breaks as needed



Our Goals Today

To give you an introductory experience to how simulation can be used to develop high performance resuscitation teams.

To increase your interest in high performance resuscitation so that you will join us in our mission, along with many others who share the same vision, of helping save lives.

To keep things light, fast-paced, and safe.

This is the no-judgment zone!



Important Things to Remember Today

We will discuss information and conduct hands-on exercises that may be different from how your organization provides medical care. This information and the practice you will see and do today should not change or alter the way you are required to perform resuscitation when working under your medical direction, unless approved by the appropriate authorities.



Important Things to Remember Today

Please be sure to consult your medical protocol or contact your supervisor, administrator or medical director, if you have any questions about the practices within your organization.



Important Things to Remember Today

If you wish to look at making these types of changes within your organization, we will be glad to provide you with information and resources to help you achieve those goals.



Your Learning Objectives

Know how measurement and feedback is essential to any resuscitation simulation

Understand how to use simulation to maximize: Individual skills Team coordination and commitment Leadership Process efficiency



Your Learning Objectives

Know simulation's role in preparing for the unexpected, and developing adaptive behavior when things don't go as planned.

Adapt behaviors to clinical settings to improve outcome of patient scenarios.

Understanding how deliberate practice and debriefing can improve performance.



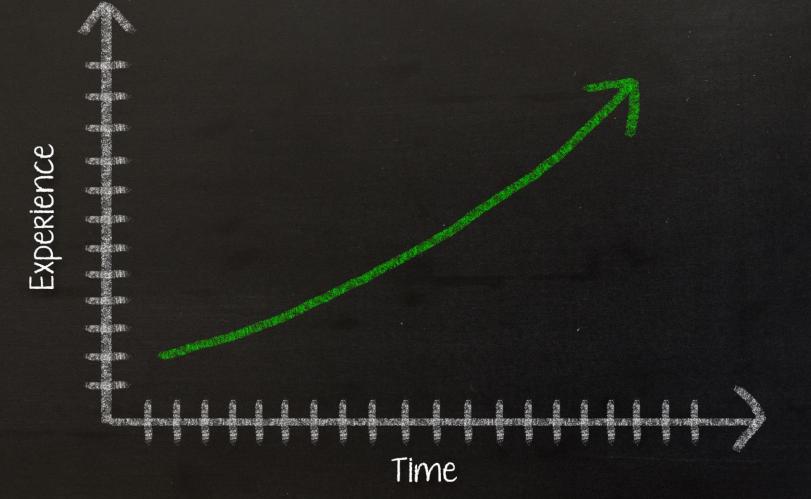
How do you feel about BLS (and ACLS) training for the average professional responder or provider?

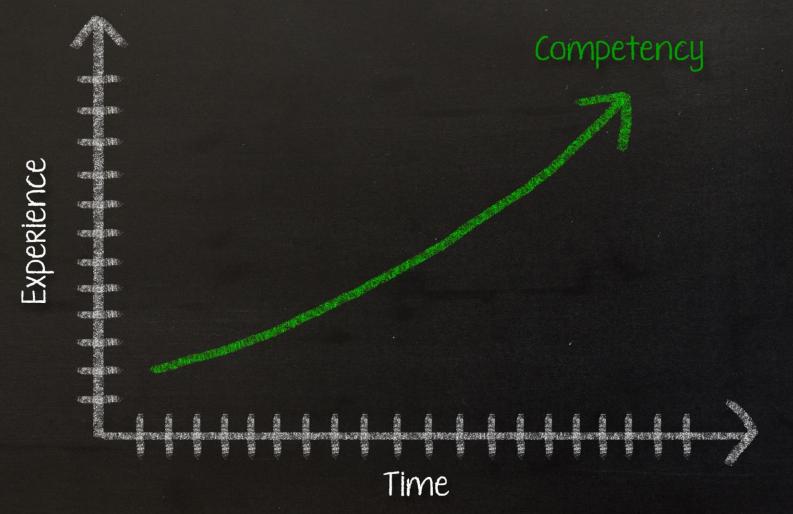
What do you think about compliance versus competency?

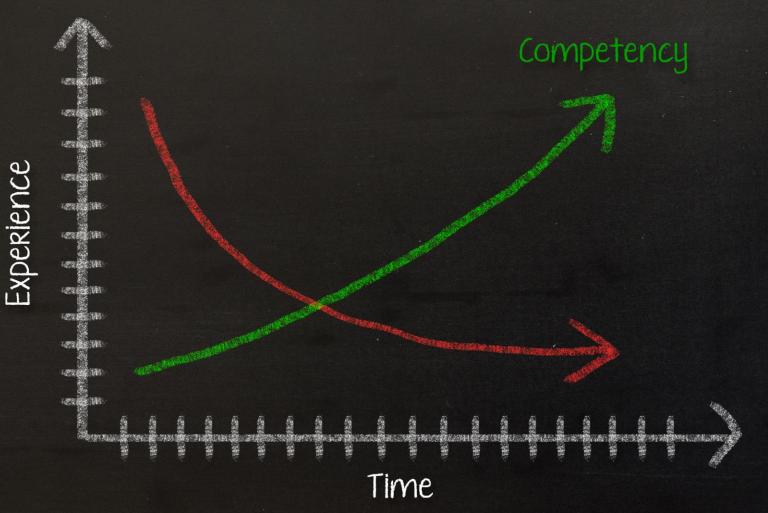
Do you think that non-measured performance without feedback leads to good patient outcomes?

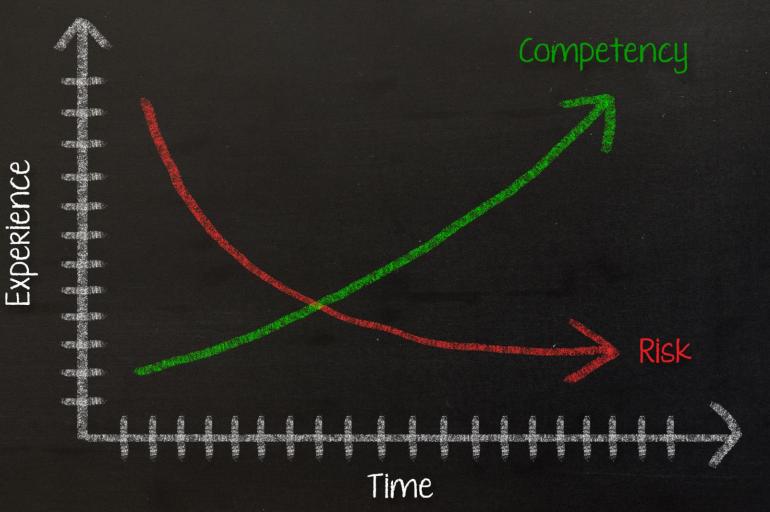
Well, lets review how each of you did when you arrived today!



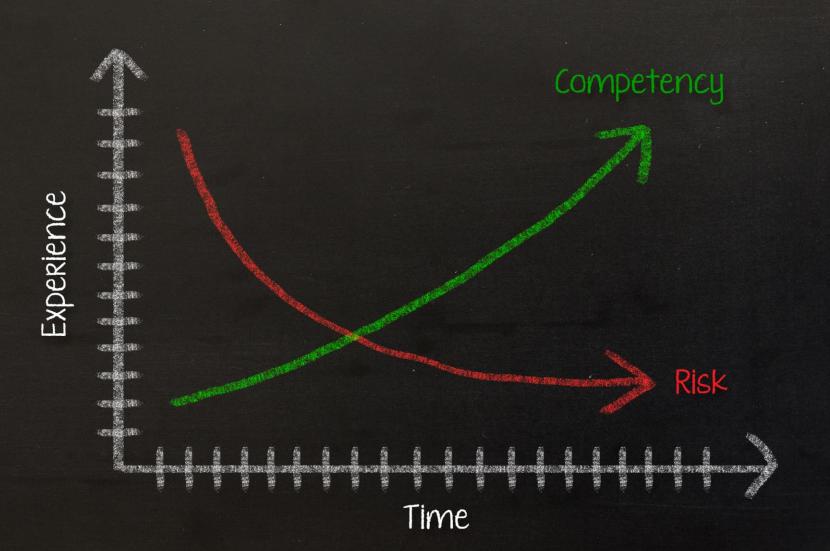




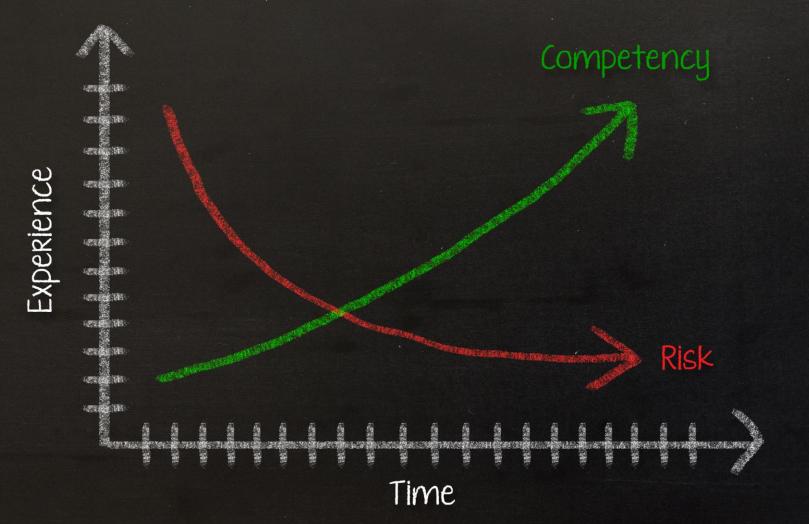




Each data point is a human life.



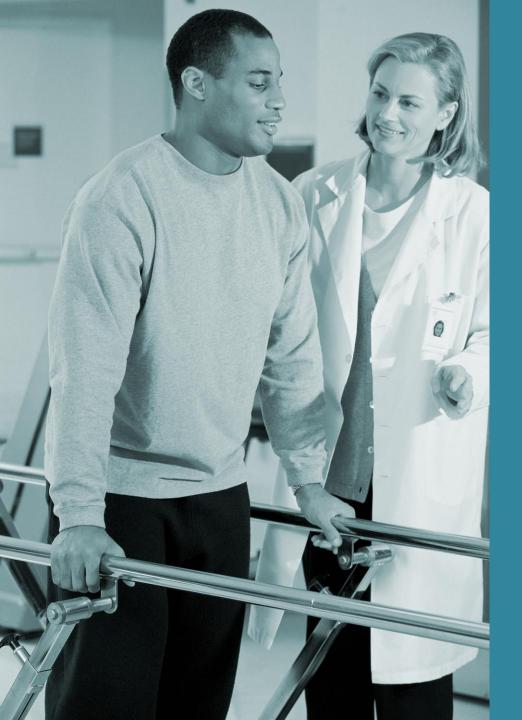
Each data point is a human life. Simulation seeks to save those lives.



Who knows what this number represents?

How about this number?

75,000



Of those 75,000 who survive,

85%

will suffer some form of neurological damage post resuscitation, due in part to the poor quality of care they received during and immediately after arrest.



And of those, only

5%

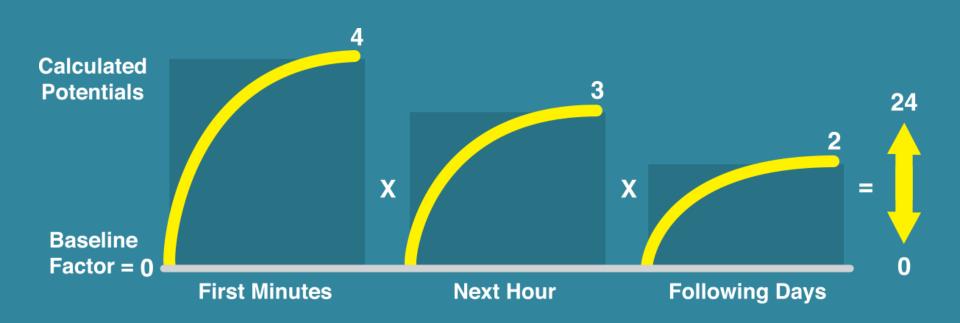
will return to their original state of neurological function



Unfortunately, training is the (relatively) simple and straightforward component of HP-CPR.

The challenge comes in recognizing that change is needed, then making it stick.

Make the Most Impact





"Measure and Improve"



Measurement and Feedback

Activity #1

Activity

Experience measurement and feedback

Goal: To improve your skills using uniform objective criteria

Learning Objective: To help you understand how measurement and feedback improves performance

Two-Person CPR

Two people each, per manikin, will perform one minute of CPR They will then rotate and do another minute of CPR Teams will objectively certify themselves Scores should be **80%** or better for a passing grade



What Do You Think?



Do you think measurement and feedback will give you a better trained and prepared professional than without?

Measurement and feedback is critical to skills training, but also team training.

Measurement and feedback will be the cornerstone for everything we learn for the remainder of the session.





Clinical Devices to Provide Feedback

Ideally, staff should have the capacity to receive feedback on the quality of CPR at the point of care.

This may include voice or visual cues on the quality of CPR (depth, interruptions or hands-off time, compression rate) that are measured and reported by the defibrillator, a handheld device, or alternative technology.

The American Heart Association's View

The AHA Consensus Statement on **CPR** Quality

How we learn CPR is not how we perform CPR.

Trained clinicians and teams do not deliver CPR even according to the basic guidelines.

Measurement and Feedback are essential to performance.

AHA Consensus Statement

CPR Quality: Improving Cardiac Resuscitation **Outcomes Both Inside and Outside the Hospital**

A Consensus Statement From the American Heart Association Endorsed by the American College of Emergency Physicians

Peter A. Meaney, MD, MPH, Chair, Bentley J. Bobrow, MD, FAHA, Co-Chair; Mary E. Mancini, RN, PhD, NE-BC, FAHA; Jim Christenson, MD; Allan R. de Caen, MD; Farhan Bhanji, MD, MSc, FAHA; Benjamin S, Abella, MD, MPhil, FAHA; Monica E. Kleinman, MD; Dana P. Edelson, MD, MS, FAHA; Robert A. Berg, MD, FAHA; Tom P. Aufdetheide, MD, FAHA; Venu Menon, MD, FAHA; Marion Leary, MSN, RN; on behalf of the CPR Quality Summit Investigators, the American Heart Association Emergency Cardiovascular Care Committee, and the Council on Cardiopulmonary, Critical Care, Perioperative and Resuscitation

Abstract-The "2010 American Heart Association Guidelines for Cardiopelmonary Resuscitation and Emerge Cardiovascular Care* increased the focus on methods to ensure that high-quality cardiopalmonary resuscitation (CPR) is performed in all resuscitation attempts. There are 5 critical components of high-quality CPR: minimize interruptions in chest compressions, provide compressions of adequate rate and depth, avoid learning between compressions, and avoid excessive ventilation. Although it is clear that high-quality CPR is the primary componentiar influencing nervival from cardiac areas, there is considerable variation in monitoring, implementation, and quality improvement. As such, CPR quality varies widely between systems and locations. Victims often do not receive high-quality CPR because of provider ambiguity in prioritization of resuscitative efforts during an artest. This ambiguity also impedes the development of optimal systems of Citrato Ritrease survival from cardiar ifront. This corporalis statement addresses the following key wear of CPR quality for the transit resour metrics of CPR performance; menituring, feedback, and integration of the patient's response to CPR, team-level logistics to gravity performance of high-scalarly CPR, and continuous quality improvement on provides, team, and systems useds. Case administration metrics and methods in continuently deliver and improve the quality of CPR with mercor the gap between two strategies and methods have been as the sections, both is not out of the hospital, and lay the foundation for further improvements in the future. (Circulation, 2013;128:00-00.)

Key Words: ATA Scientific Statements - carliac areat - CPR - CPR quality - sulcons -

Worldwide, there are >135 million cardiovascular deaths each year, and the provalence of coronary heart dismore is increasing.¹ Globally, the incidence of out-of-hospital cardiac arrest ranges from 20 to 140 per 100000 people,

and survival ranges from 2% to 11%.3 In the United States, >500000 children and adults experience a cardiac arrest, and <15% sarvive.13 This establishes cardiac areat as one of the most lethal public health problems in the United States,

@ 2013 American Heart Acceptation, In-Greaksion is available at http://drc.abajournalcory.

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2010 Guidelines vs. 2013 Consensus

The AHA's Consensus Statement on CPR Quality is not intended to contradict the 2010 AHA Guidelines for CPR and ECC.

The intent is to fill the gap between the existing scientific evidence surrounding resuscitation and the translation of the [2010 AHA] guidelines into routine clinical practice.¹

The 2010 Guidelines provide a proven baseline for CPR. The 2013 Consensus Statement provides a roadmap for optimizing delivery of CPR within the Guidelines.

¹Meaney PA, Bobrow BJ, Mancini ME, Christenson J, de Caen AR, Bhanji F, Abella BS, Kleinman ME, Edelson DP, Berg RA, Aufderheide P, Menon V, Leary M; on behalf of the CPR Quality Summit Investigators, the American Heart Association Emergency Cardiovascular Care Committee, and the Council on Cardiopulmonary, Critical Care, Perioperative and Resuscitation. CPR quality: improving cardiac resuscitation outcomes both inside and outside the hospital: a consensus statement from the American Heart Association. Circulation. 2013;128: Page 2

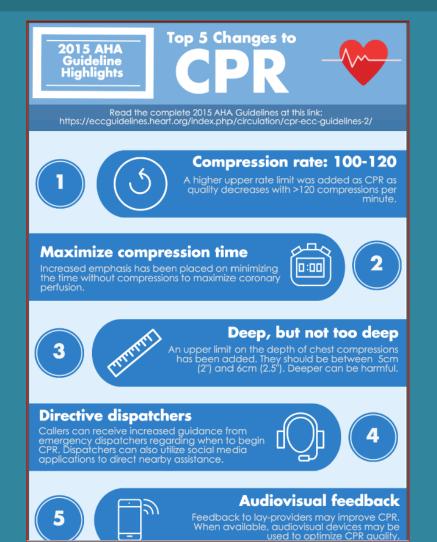


Five Key Metrics

- 1 Chest Compression Fraction: (CCF), i.e. Compression Time/Total Arrest Time > 80%.
- 2 Rate: chest compression rate of 100 to 120/min
- 3 Depth: Chest Compression Depth between 2-2 ½ inches in Adults and at Least One Third the Anterior-Posterior Dimension of the Chest in Infants and Children.
- 4 Recoil: Full Chest Recoil and No Residual Leaning
- 5 Ventilations: Avoid Excessive Ventilation- Rate <12 Breaths per Minute, Minimal Chest Rise



Top 5 Changes to CPR



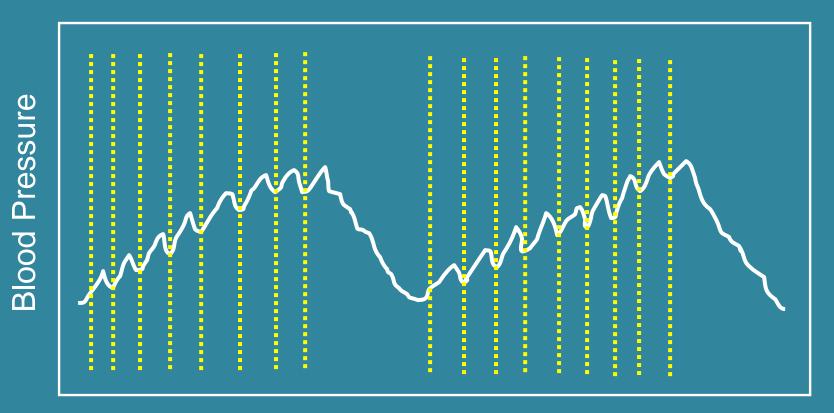


Chest Compression Fraction has a proven correlation to defibrillation success.

Give your patient a chance!



Standard CPR vs. CC Alone



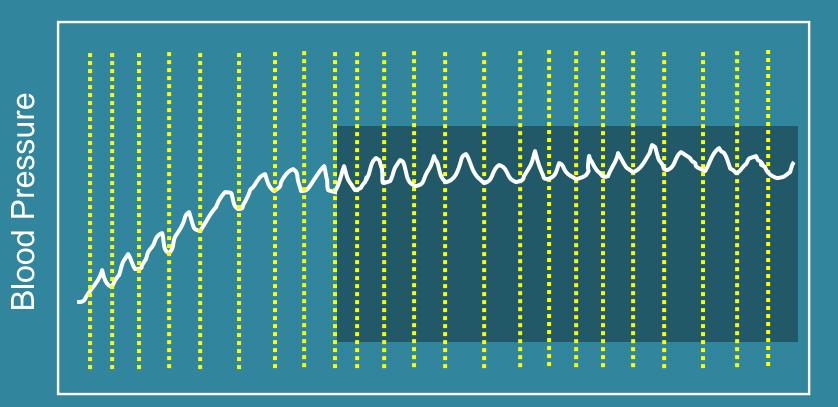
Time



Berg et all, 2001



Standard CPR vs. CC Alone



Time



Berg et all, 2001



Between 10 and 20 seconds of hands-off time, defibrillation success drops by 20% and continues a downward spiral.

Give your patient a chance!



Run and Examine a Basic Code

Activity #2

Activity

Experience how a code can be run when not pre-planned for maximum compression time.

Goal: Establish a baseline for where performance is today

Learning Objective: To understand that a code process needs to be mapped out and practice for maximized compression time.

Three-Person Code

Two people from Team 1 and Team 2, respectively, will be asked to begin CPR on the patient

A third from Team 1 and 2 will arrive with AEDs for their teams

We will run the code for five minutes



Run and Debrief a Basic Code

Activity #2

Activities

Those observing will note...
Location of the compressor
Compressor's activities
Challenges faced by putting on the AED
Any possible confusion about roles and responsibilities
How performance shown on the monitor showed any possible loss in Chest Compression Fraction

Run the code for five minutes



What Can Simulation Teach Us?

Discussion

What if anything interfered with chest compression fraction and other key metrics?How can we re-design the process better?Where do we need to remediate? Individual skills?

Team coordination or communication?

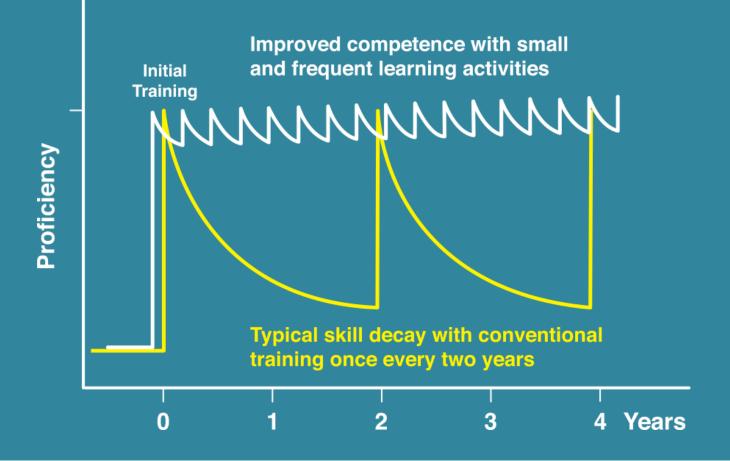
Leadership?

Process or equipment issues?



Low-Dose High-Frequency Training

Improve Confidence and Competence





High-Performance CPR is a concept that means each member of the team knows exactly what to do, when to do it, and how to do it.

Key elements include:

Ensuring 360 degree access to the patient

Communicating in a calm and concise manner

Using a cardiac arrest checklist

Identifying a team leader

Adopting pre-defined roles and positions around the patient



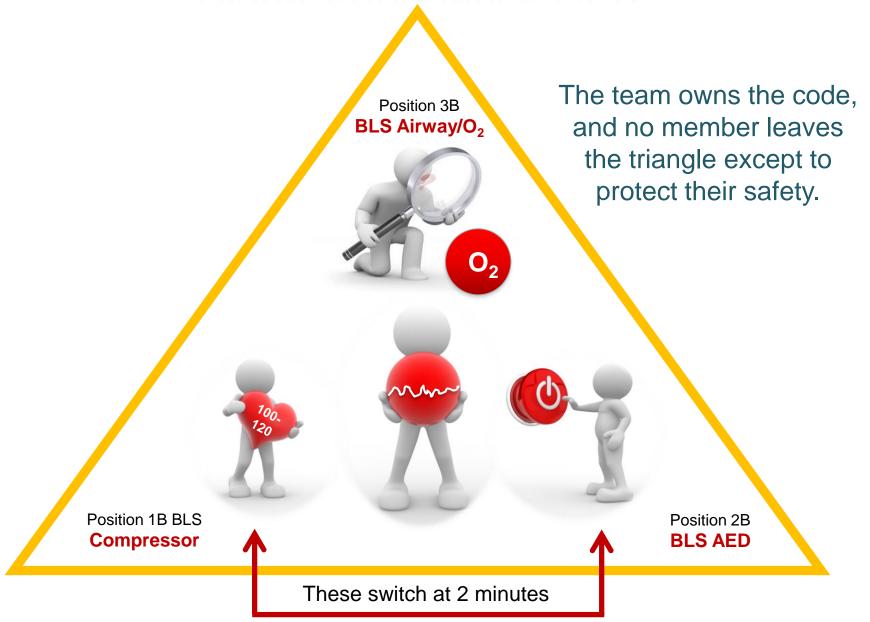
HP-CPR is about planning, measuring, training for continuously improved performance against the five metrics.

Any activity that can rob a patient of hands on time is either eliminated, minimized, or run in parallel.

Time savings everywhere:

Unnecessary pulse checks eliminated Ventilation time compressed AED pad placement done in parallel Minimized time returning to compressions after shock delivered Advance Airway run in parallel IV or IO established in parallel Equipment properly accessible and functional

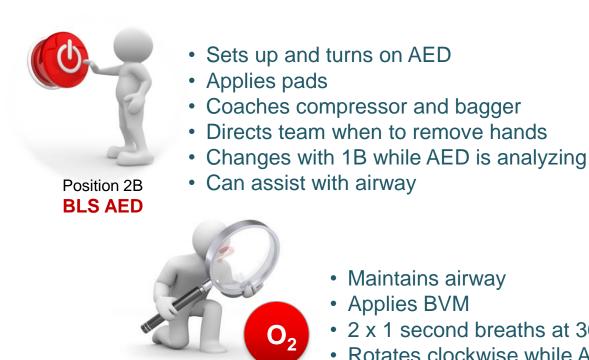




Team Roles



Position 1B BLS Compressor



Patient assessment – CAB

Initiates 100 compressions

Rotates clockwise while AED is analyzing

Counts out loud

Position 3B BLS Airway/O₂

- Maintains airway
- Applies BVM
- 2 x 1 second breaths at 30 compressions
- Rotates clockwise while AED is analyzing
- Inserts airway allowable airway

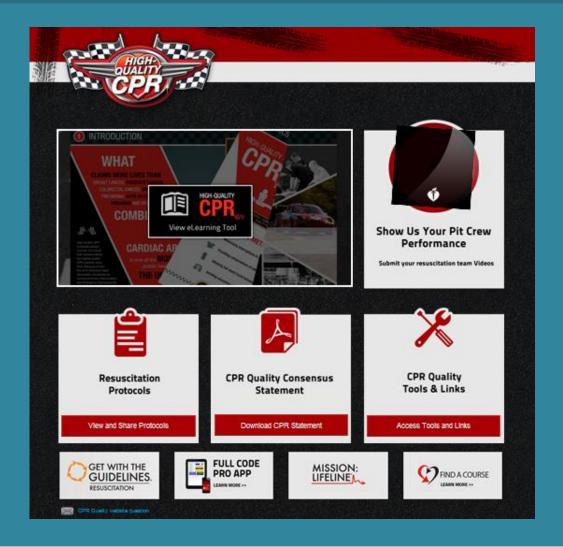


Pit Crew Resuscitation Debrief Score Card

CPR			
REPORT General Check	CARD dist		REPORT CARD CPR Quality Analysis
EVENT NUMBER / DATE			EVENT NUMBER / DATE
	NO INTERM	EDIATE YES	
Was the team leader clearly identified?	0 0	0	Compression fraction Greater than 80%
Was the scene orderly and quiet?	0 0		Mean compression rate (compressions/min)
Was the defibrillator applied quickly?	0 0	0	100 to 120 compression/min
Was CPR started promptly?	0 0		Mean compression depth (mm)
Were pauses in CPR delivery minimized?	0 0	0	ADULTS: at least 50 mm (2 inches) INFANTS and CHLDRR: at least 1/3 AP dimension of chest
/as CPR of subjectively high quality?	0 0		Compressions without leaning %
Were peri-shock pauses minimized?	0 0	-	Mean ventilation rate (breaths/min)
Was an airway secured efficiently?	0 0		Less than 12 breatha/min; minimal chest rise
COMMENTS			COMMENTS
American Heart Associati			American Heart Association.
•			Association.



HP-CPR Tool Kit





Run a High-Performance CPR Team Scenario



Activity

Experience how a code can be run as a HP CPR crew exercise

Goal: Improve performance over previous exercise

Learning Objective: To know and experience the difference in using a pit crew style approach.

Three-Person Code

Two people from each team will be asked to begin CPR on the patient

A third from each team will arrive with an AEDs for their teams

We will let the code run for five minutes



Run a HP-CPR Exercise

Activity #3

Activities

Those observing will note:

- Location of the compressor
- Challenges faced by putting on the AED
- Any possible confusion about roles and responsibilities
- How performance shown on the monitor showed any possible loss in Chest Compression Fraction

Observers will use the score card this time to track performance

Participants will perform a two-minute walk through

Run the code for five minutes



What Can Simulation Teach Us?



Activity

Did HP-CPR Performance Improve Chest Compression Fraction and other key metrics What could the teams have done even better? Where do we need to remediate? Individual skills? Team coordination or communication? Leadership? Process or equipment issues?





The most sobering fact about team failure?

The Crucial Dynamic



The leading cause of injury and preventable harm to patients is poor communication among the healthcare team

The Repercussions?

What's Next?

Who thinks cohesive teams are starting to develop?

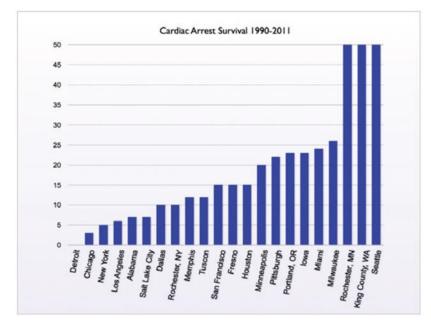
We are going to test, disrupt, and strengthen the teams by introducing the following factors:

Leadership The unexpected Changes in the environment

Watch how measurement and feedback keeps the teams focused.



What Does Success Look Like







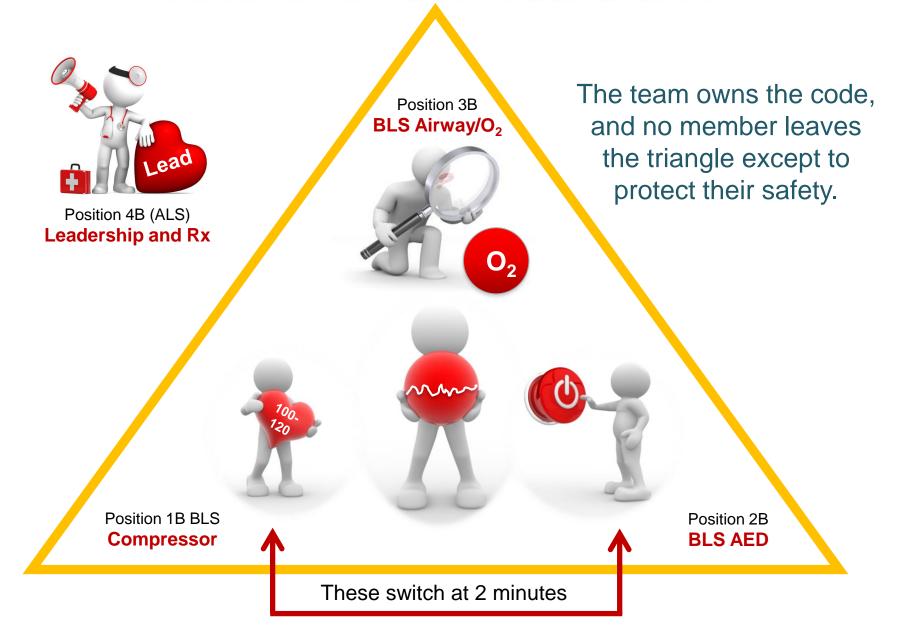
The King County EMS Experience

Instituted protocol changes like those now advocated by the AHA Consensus Statement

Survival from sudden cardiac arrest rates increased from 33% in 2002-2004 to most recently 52%, according to King County Medic One



Introducing Team Leadership



HP Leadership Roles



Position 4B (ALS) Leadership and Rx

Coaches to the metrics Ensures team energy Reinforces closed loop communications **IO** Access Epinephrine stat after 400 compression Communicates with family/medical command Leader remains out of the CPR Triangle Leader should use language that everyone understands Leader should monitor patient and every process being performed on the patient

Practicing Leadership Skills

Activity

Experience how a pit crew team can be run with a leader.

Goal: Improve performance over previous exercise

Learning Objective: To know and experience the importance of leadership on a pit crew team.

Four-Person Code

Each team chooses a leader.

The leader is replaced by one of the observers

Teams are already equipped with AEDs, but did not see patient code: **DO NOT SHOCK UNTIL ONE MINUTE OF CPR.**

We will let the code run for five minutes.

The team will perform a one minute dress rehearsal first lead by the class leaders



Activity

How Does Leadership Change the Dynamic?



Activities

Those observing will note whether the leader... Coached to the metrics Ensured team energy Reinforces closed loop communications Supported and guided the new team member Observers will use the score card to track performance

The team will perform a one minute dress rehearsal first lead by the class leaders

Run the code for five minutes



What can simulation teach us?

Activity

Did leadership improve chest compression fraction and other key metrics?

What could the leader and his followers have done even better?

Where do we need to remediate? Individual skills? Team coordination or communication? Leadership? Process or equipment issues?



Activity





High-performance CPR is a concept that means each member of the team knows exactly what to do, when to do it, and how to do it.

Key elements include:

- Ensuring 360 degree access to the patient
- Communicating in a calm, concise manner
- Using a cardiac arrest checklist
- Identifying a team leader
- Adopting pre-defined roles and positions around the patient

Buy-In

Research indicates that HP-CPR can save lives. In order to create an environment of sustained HP-CPR, everyone must be on board. EMTs first on scene must take responsibility or "own" the CPR portion of the resuscitation. When paramedics arrive, they will perform the advanced life support measures of the resuscitation and work in coordination with ongoing CPR. For systems in which an EMT/paramedic team arrives first at the scene, the EMT must assume responsibility for CPR, while the paramedic assumes responsibility for ALS. The goal is for additional resuscitation care, such as defibrillation, medication therapies, or airway management to compliment CPR. CPR should be the default action at all times.

In order to have effective HP-CPR, all involved must work as a team, not as separate entities. In order to achieve this goal, HP-CPR must start at the top and be endorsed by the EMS chief and medical director. The value of HP-CPR must be communicated to the men and women who actually perform the resuscitation.



10 Principles of HP-CPR



- 1 EMTs own CPR
- 2 Minimize interruptions in CPR at all times
- 3 Ensure proper depth of compressions (> 2 inches)
- 4 Ensure full chest recoil/decompression
- 5 Ensure proper chest compression rate (100-120/min)
- 6 Rotate compressors every 2 minutes
- 7 Hover hands over chest during shock administration and be ready to compress as soon as patient is cleared
- 8 Intubate or place advanced airway with ongoing CPR
- 9 Place IV or IO with ongoing CPR
- 10 Coordination and teamwork between EMTs and paramedics



Dealing with the Unexpected

Plans are nothing; planning is everything.

Individual skills, team coordination, efficient processes, and leadership are an essential cornerstone to dealing with the unexpected.

Simulation is an important means to test the strength of all of those in the face of the unexpected.

Equipment failures Team member injury or no-show Environmental factors Anything Murphy can throw at us



Your team must live for Chest Compression Fraction

In a world where things go wrong...

Managing the Unexpected

Activity #5

Activity

Experience coping with environmental changes holding true to piccrew principles

Goal: Improve performance over previous exercise

Learning Objective: To know and understand how individual skills, team coordination, efficient processes, and leadership prevent environmental changes from hampering performance

Four-Person Code

Team is given an AED

Team is given a spare AED battery, a pocket mask, a flashlight, and other items

The team will perform five min

The team will perform five minutes of CPR



Managing the Unexpected

Activity #5

Activities

Those observing will note whether...

The team members adapted and responded to unexpected obstacles The most logical person responded to a team member change The team leader and team members communicated openly The team maintained a cohesive can-do attitude

Observers will use the score card this time to track performance

Run the code for five minutes



What can simulation teach us?

Activity #5

Activity

- Did everyone improvise, adapt, overcome to maintain chest compression fraction and other key metrics?
- What could the leader and his followers have done even better?
- Where do we need to remediate?
 - Individual skills? Team coordination or communication? Leadership? Process or equipment issues?



Changes in the Environment

Discussion

Do you think we are developing a cohesive aggressive team?

Environmental changes can challenge a team like no other, because we tend to practice in routine or expected environments.

If environmental changes are not part of simulation training, you may be missing your greatest opportunity to build team cohesion, resilience, and aggressiveness.

In a moment: your graduation exercise!





Good teams know not to expect the expected.

Environment: Change it



Your Learning Objectives

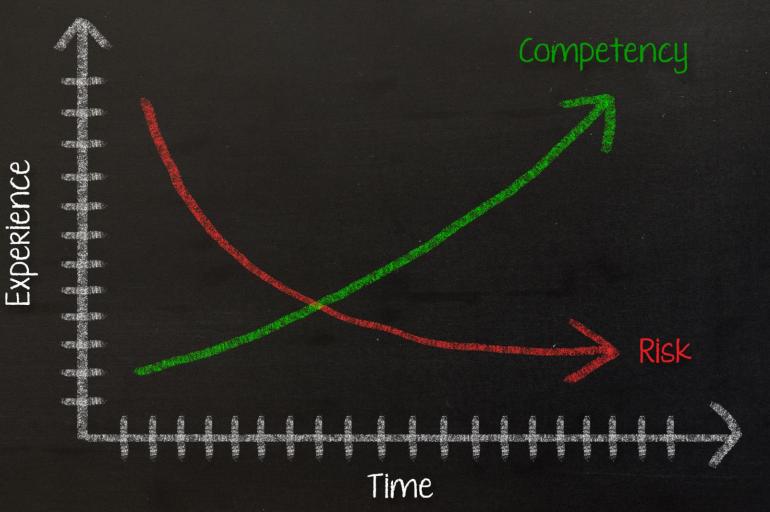
Know how measurement and feedback is essential to any resuscitation simulation

Understand how to use simulation to maximize: Individual skills Team coordination and commitment Leadership Process efficiency

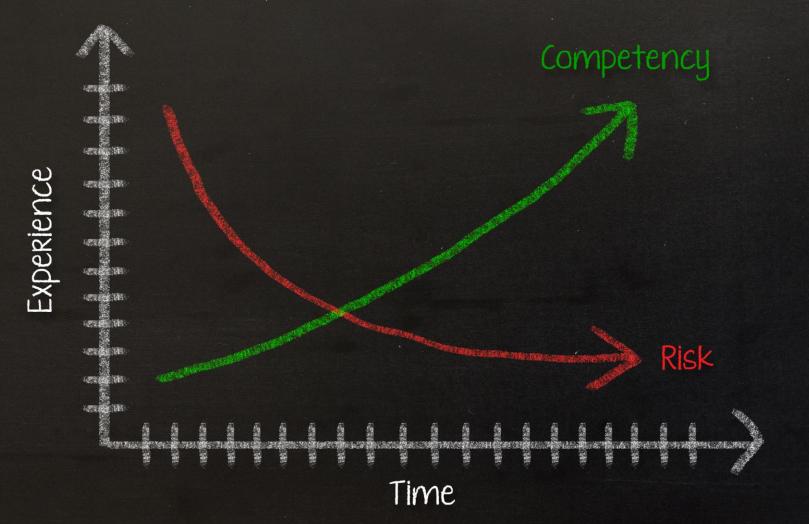
Know simulation's role in preparing for the unexpected, and developing adaptive behavior when things don't go as planned.



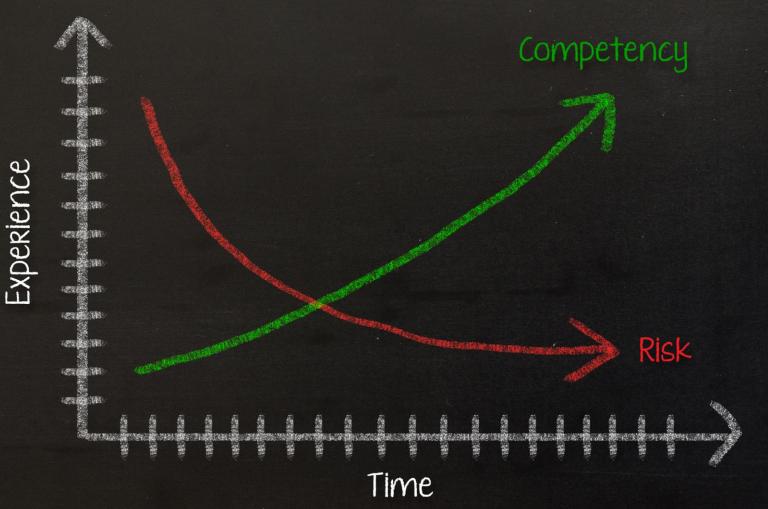
The Learning Curve A Universal Problem



Each data point is a human life. Simulation seeks to save those lives.



We Stand In The Gap A Universal Problem



Compliance vs. Competence

"Compliance is about what we must do; ethics is about what we should do."

- Michael Josephson



Resources

The Resuscitation Academy

http://www.resuscitationacademy.org/

• The American Heart Association

http://cpr.heart.org/AHAECC/CPRAndECC/ResuscitationScience/High-QualityCPR/UCM_473208_High-Quality-CPR.jsp

• The Minnesota Advanced Care Tool Kit

https://www.dom.umn.edu/divisions/cardiovascular/division-sections/minnesota-resuscitation-consortium



Improved Outcomes Start Today

"Past experience tends to guide future experience. Once teams train and practice their craft, as if they intend to save a life, and do, then success becomes the new normal.

Start by asking yourself, your teammates and your organizational leaders, 'How can we do better?', and you'll be on the way to a high-performance new normal."

The Resuscitation Academy





How was this experience for you today?

Did we meet our learning objectives?

What are some of take-aways for you?





When you go back to your organizations...

What would you like to change first?

What feedback would you want to get from your CPR Events?



Debrief

How will you maximize... Individual skills Team coordination and commitment Leadership Process efficiency

How will you prepare for the unexpected, and developing adaptive behavior when things don't go as planned?







End-of-Day Challenge

Debriefing and Deliberate Practice



Managing Change



The Dave Foster Story

