CODE TEAM TRAINING AND ASSESSMENT: BEST PRACTICES FROM THE FLOOR

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Disclosures

- Tensing Maa, MD: no disclosures or conflicts of interest
- Keshava M. N. Gowda, MD: no disclosures or conflicts of interest
- Claire Stewart, MD: no disclosures or conflicts of interest

Objectives

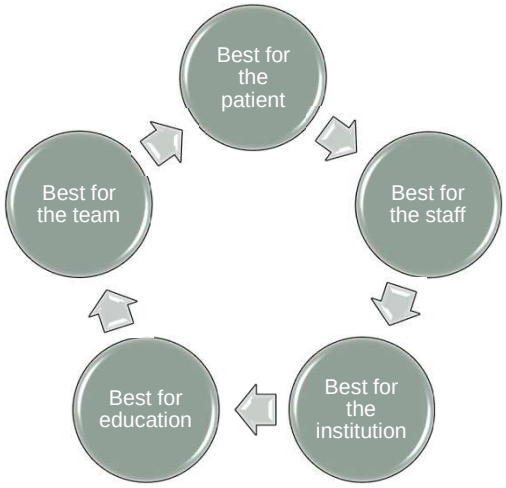
1. Identify common inefficiencies that occur during pediatric resuscitation.
2. List methods for training teams to respond to in-hospital emergencies on the general wards and in critical care units.
3. Learn key applications of just-in-time training and video review for training multi-disciplinary, hospital-wide code teams.
4. Discuss current practices and barriers to implementation of team training.

HOW DO YOU MAKE YOUR TEAM THE BEST?

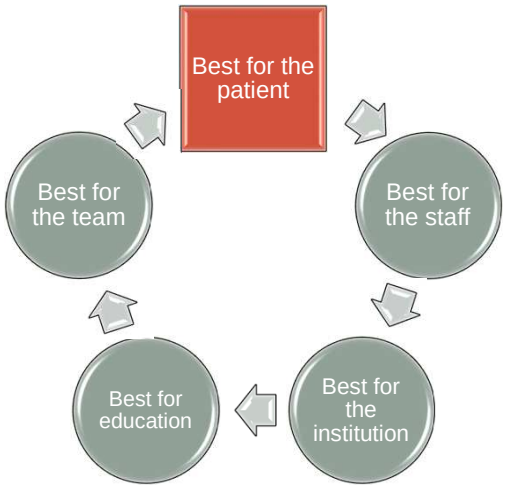
What does it mean?

From who's perspective?

What do we mean by best?



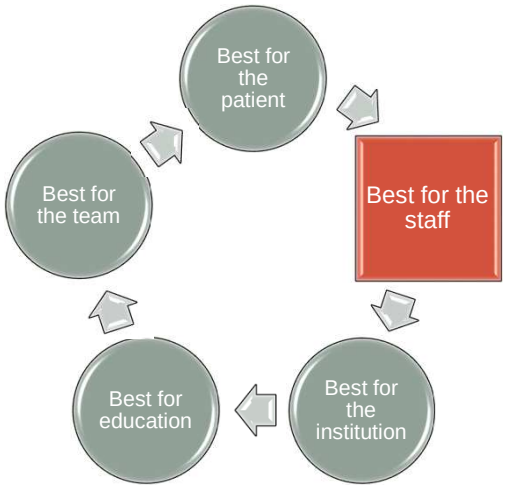
What do we mean by best?



Best for the patient

- High quality CPR
- Minimal pain
- Highly functioning team
  - Recent training
- Unlimited resources, despite time of day

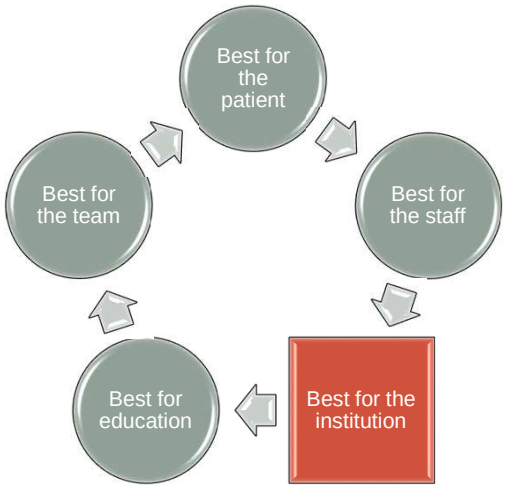
What do we mean by best?



Best for the staff?

- Perform a role in their comfort zone
- Receive support from code team members
- Encouraging, positive feedback
- Resources readily available
- Debrief after the event
  - Questions answered
  - Goal to improve future performance

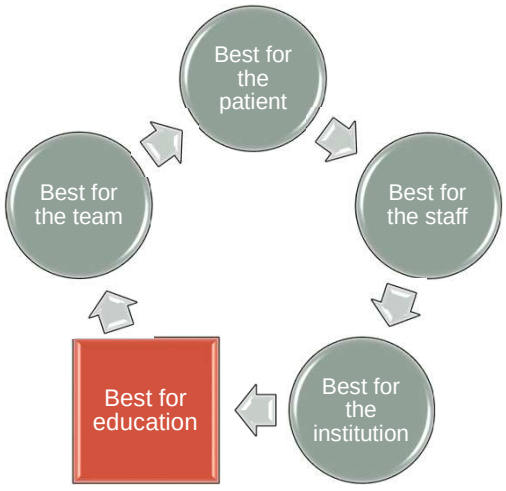
What do we mean by best?



Best for the institution

- Consistent – and high quality performance
- Reliable and timely
- Minimally disruptive to patient care elsewhere
- Cost effective
- Accountable/responsive
- Self sustaining
- Track results

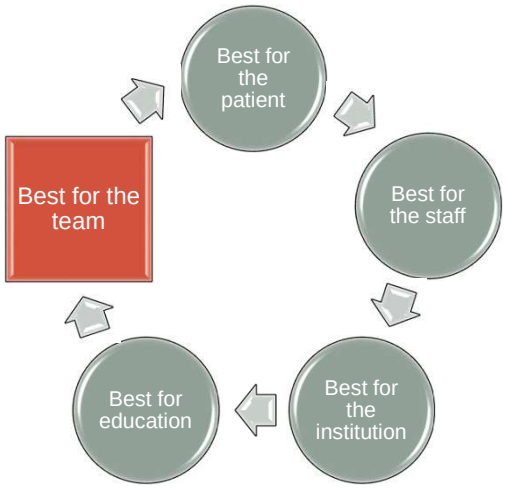
What do we mean by best?



Best for education

- Trainees involved in a significant role
- New staff able to ‘on-board’ seamlessly
- Training is frequent, but not burdensome
- Training is timely and to the point
- Feedback is constructive and reinforced
- Real situations are replicated in simulation
- Safe learning environment

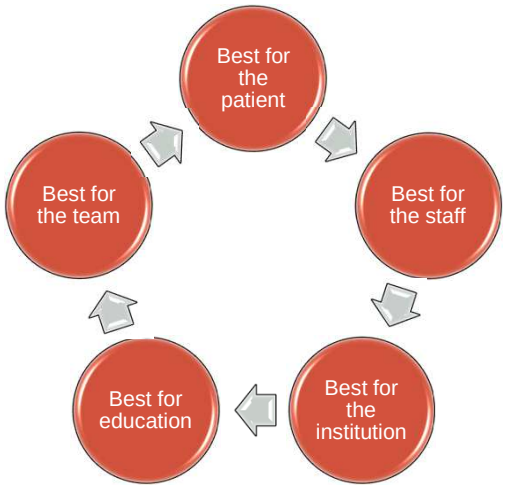
What do we mean by best?



Best for the team

- Train as a team → perform as a team
- Build trust, can rely on other team members
- Clear roles going into the shift
- Receptive leadership modeled
- Active followership encouraged
- Feedback, debriefing, safe environment

What do we mean by best?



IMPROVING EMERGENCY-RESPONSE ON THE FLOORS: THE FIRST 5 MINUTES…

Tensing Maa, MD
Director, In situ simulation
Co-Chair, Code Blue Committee

Deficits during real and mock codes

- Participant confusion about their role before and after arrival of code team.
  - Delay in starting early interventions
- Lack of team leadership and organization.
- PALS / ACLS not followed.
- Breakdown in communication.
  - Hesitancy to challenge hierarchy
  - Did not know when to ask for help

Hunt et al 2008

Need for More Education

Lack of understanding of what the expectations are during an emergency.

- Floor team waiting for arrival of Code Blue team before starting resuscitation (BLS).
- Some nurses are not PALS certified.
- New or less experienced staff.
- No formal resident training for code team leadership and little opportunity to practice their EMERGENT critical thinking skills.

START

Simulation ***T***raining for ***A***ssessment ***R***esuscitation and ***T***eamwork

- **Learners**:
  - Multi-disciplinary, inpatient, ward-specific teams (RN, RT, PCA, UC, Resident covering that unit…)
  - Code blue team **NOT** included (except pharmacy).
- **Scenario**: Pediatric respiratory and /or cardiac emergencies
- **Competency** areas targeted
  - Assessment: recognition of deterioration
  - Medical management: "*First 5 minutes*"
  - Non-technical skills: Crisis Resource Management (CRM), communication, teamwork

START: Simulation Training

- Practice skills and strategies in a safe learning environment.
- "In Situ" simulation: occurs in the real clinical environment, utilizes real medical equipment.
  - Improved transfer of skills and behaviors learned during training to practice. (Hayes 1988, Allan 2010)
- Scheduled sessions that utilize on-duty staff.
  - Sessions last 45-60 mins.
  - Mostly day sessions, less frequently on night shift
  - Pre-brief with intro to simulator and expectations.
- Debriefing with co-facilitation from multidisciplinary content experts (MD, RN, PharmD).

*START …*for *A*ssessment,

- Identify a deteriorating patient
  - Changes in vital signs and clinical exam, altered mental status, PEWS
  - When do you call for help? Who to call? And How?
    - Rapid Response Team vs Code Blue
- First responders need to initiate early interventions.
- Action linked phrases to reduce reaction times (Hunt 2014)
  - He's not breathing…. Start BMV.
  - I can't feel a pulse…. Start chest compressions.

*START … R*esuscitation

- What to do in those "First 5 minutes" before the code team arrives?
  - Start CPR if indicated
  - Gather emergency equipment
  - Optimize patient positioning and room layout
  - Mask ventilate
  - Obtain IV access
  - Place backboard
  - Place pads and turn on defibrillator for CPR feedback

START… and *T*eamwork

- Resident identifies self and acts as team leader
- Crisis Resource Management (CRM)
  - Role assignment
  - Situational awareness
  - Prevent and manage fixation errors
  - Balance resources
- Communication
  - Clear messages,
  - Avoid mitigated speech
    - SBAR to code blue team
  - Closed- loop communication
  - Flattening of hierarchy
- Professionalism

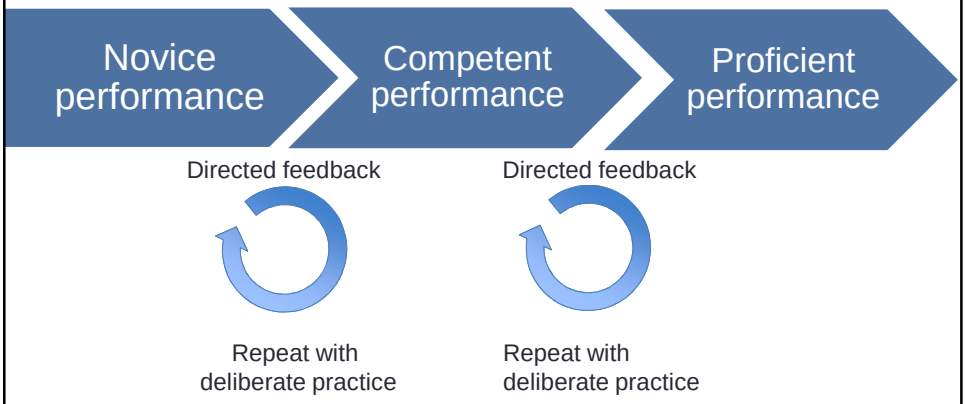
Initial barriers

- Staff reluctant to participate.
  - Poor prior experience with mock codes.
  - Difficult for them to see immediate improvement.
  - Conflict with patient-care responsibilities while they are on-duty.
- Simulation is time and labor intensive.

How best to quickly and efficiently train staff?

Rapid Cycle, Deliberate Practice

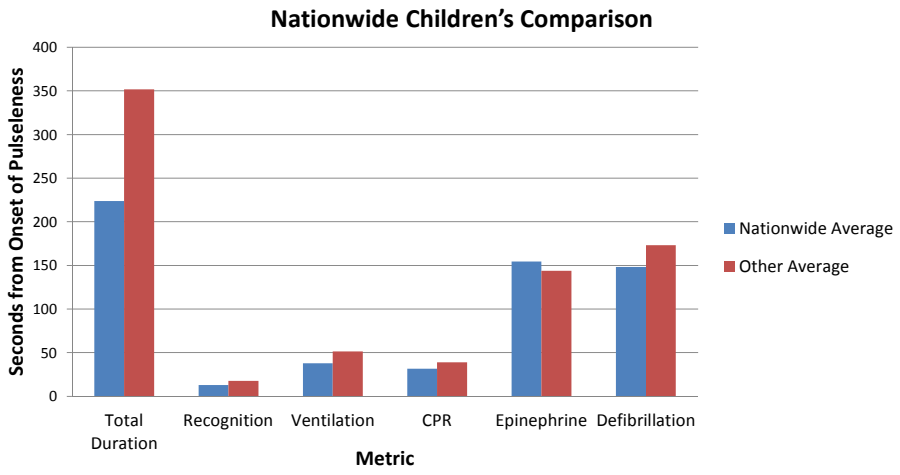
- Directed feedback via "coaching style" given several times mid-scenario.
- Repeat simulation from the beginning with deliberate practice of new (good) behaviors.



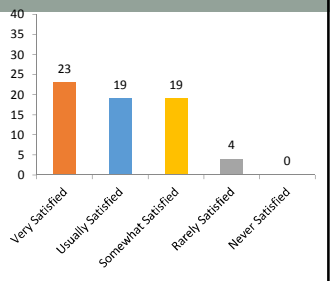
Hunt 2014

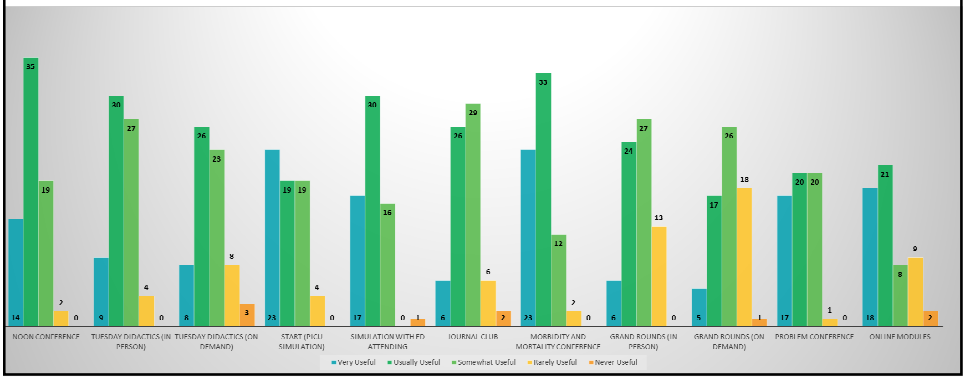
Insert video example?

International Simulation Data Registry for Cardiac Arrests

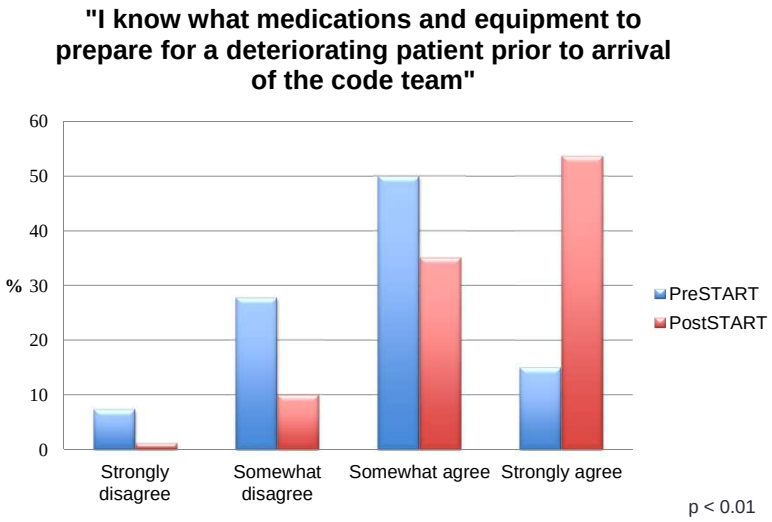


Resident evaluation of START program





Program evaluation:



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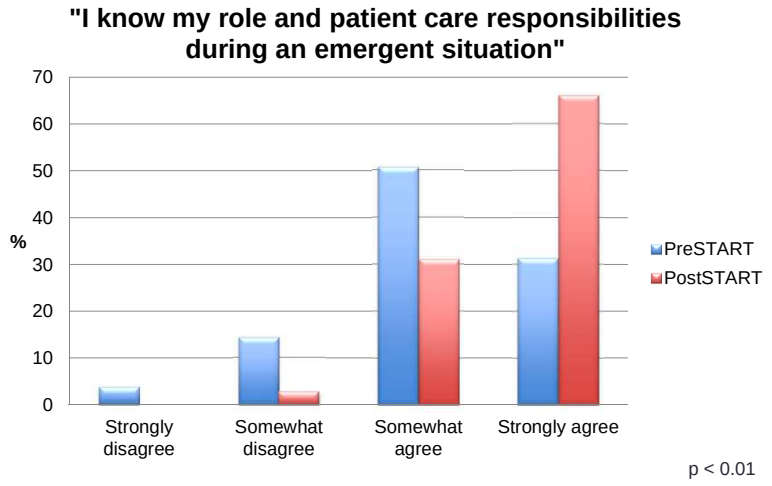

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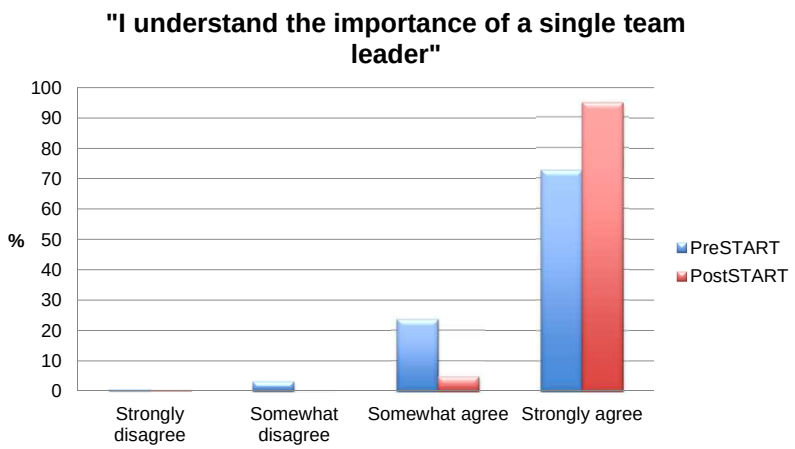

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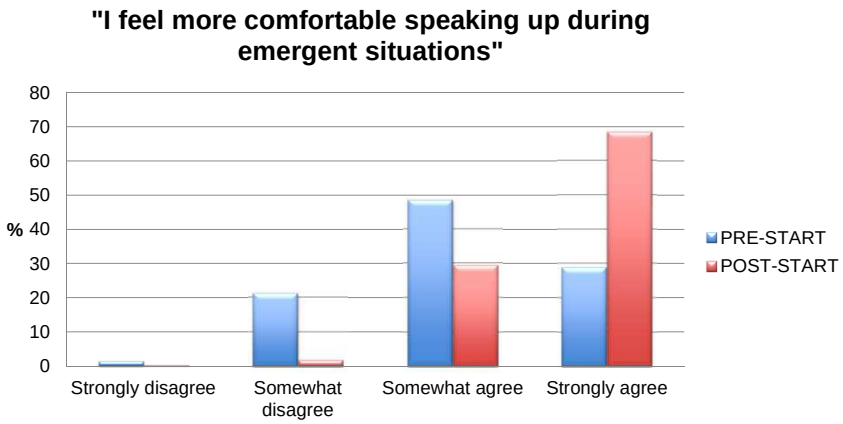

$p < 0.01$

References

1. Hunt EA, Walker AR, Shaffner DH, et al. Simulation of In-hospital pediatric medical emergencies and cardiopulmonary arrests: highlighting the importance of the first 5 minutes. Pediatrics 2008 ;121(1):e34-43.
2. Hays RT, Singer MJ. Simulation Fidelity in Training System Design: Bridging the Gap Between Reality and Training. New York, NY: Springer-Verlag; 1988.
3. Allan CK, Thiagarajan RR, Beke D, Imprescia A, Kappus LJ, Garden A, et al. Simulation-based training delivered directly to the pediatric cardiac intensive care unit engenders preparedness, comfort and decreased anxiety among multidisciplinary resuscitation teams. J Thorac Cardiovasc Surg. 2010;140(3):646-52.
4. Hunt EA, Duval-Arnould JM, Nelson-mcMillan KL, et al. Pediatric resident resuscitation skills improve after "Rapid Cycle Deliberate Practice" training. Resuscitation 2014;85(7):945-51.

Keshava Murthy Narayana Gowda

Chair of Pediatric Critical Response Committee

Director of Simulation in PICU

Cleveland Clinic

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Code team training in PICU

- Cleveland Clinic Foundation has been participating in GWTG-Resuscitation.

- High quality CPR should be the foundation in all resuscitation attempts

✓ Chest compression fraction

✓ Chest compression rate

✓Chest compression depth

✓Chest recoil

✓Ventilation

❖ A consensus statement from American Heart Association

Monitoring of CPR quality

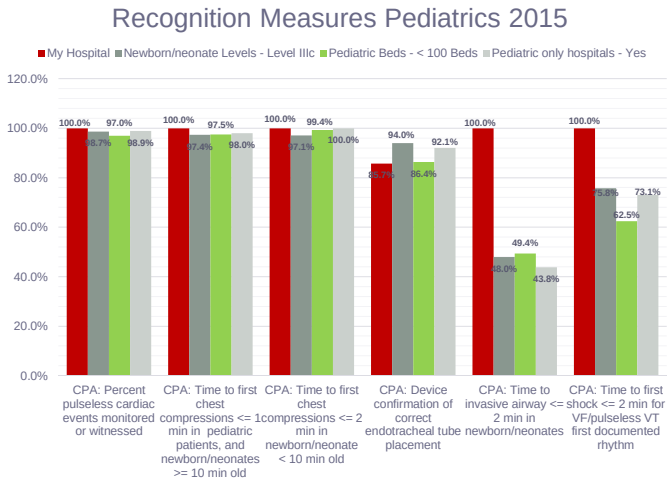
- How the patient is doing
  - Coronary Perfusion Pressure > 20 mmHg
  - Arterial Diastolic Pressure>25 mmHg
  - ETC02>20 mmHg
- How the rescuers are doing
  - Visual observation

In hospital resuscitation event measures- *Pediatric recognition measures*

- Percent pulseless cardiac events monitored or witnessed
- Percent of events where time to first compression ≤ 1 minute
- Percent of events with an ETT placement which was confirmed to be correct
- Percent of initial VF/pulseless VT rhythm with time to first shock ≤ 2 minutes

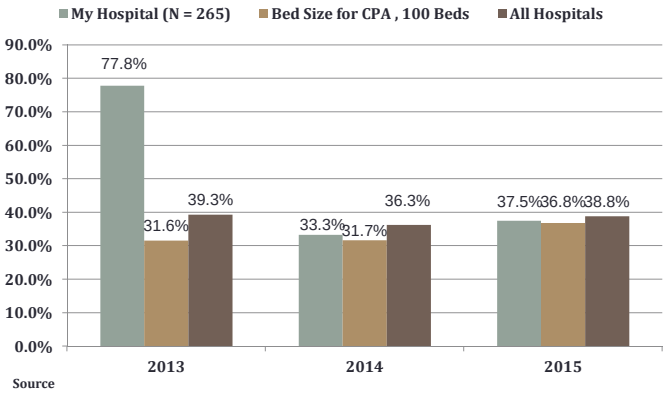
Pediatric quality measures

- Percent of events with an ETT placement confirmed to be correct
- Percent of events with time to first assisted ventilation ≤ 1 minute



Pediatrics CPA Index Event:

Hospital Survival



Overcoming barriers of assembling busy inter professional staff for training

- Schedules
- Space
- Equipment
- Timing
- Personnel

Difficulty giving feedback to faculty as opposed to trainees

- Be able to describe one's own role clearly to others
- Know and respect the role of others in relation to one's own role
- Know the limitation/constraints of one's own role
- Be effective at resolving conflicts
- Collaborate with others for the needs of the patient
- Be tolerant of differences

Varian, F. *et al* (2013), 'Overcoming Barriers to Interprofessional Communication: How Can Situational Judgement Dilemmas Help?,' *Reinvention: an International Journal of Undergraduate Research*, Volume 6, Issue 2,

Resources

- http://www.heart.org/HEARTORG/HealthcareResearch/GetWithTheGuidelines/GetWithTheGuidelines-Resuscitation/Get-With-The-Guidelines-Resuscitation-Clinical-Tools_UCM_314499_Article.jsp

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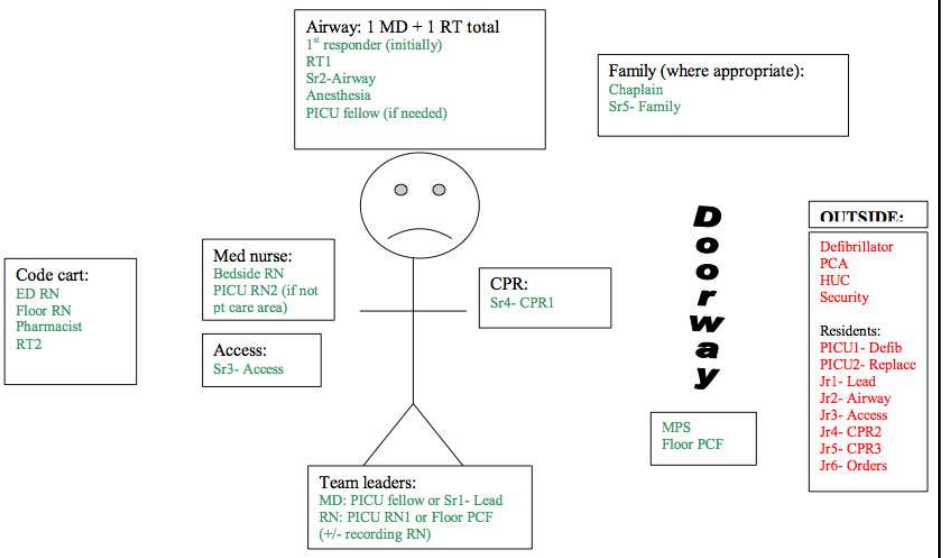
TRAINING THE HOSPITAL-WIDE RESUSCITATION TEAM

SUCCESSES AND CHALLENGES

Claire A. Stewart MD, MEd
Cincinnati Children's Hospital Medical Center

Our Own Experience

- In 2013, following an SSE related to the code team, we organized to revise and restructure our entire code team process
- Prior to updates: 11 residents and 13 RTs carried code pagers in addition to PICU/CICU/ED nurses, PICU fellows, pharmacist, and chaplain
- Roles were outlined, but not assigned prior to event
- Training was primarily through frequent mock codes, which were time limited to 10 minutes of simulation, 10 minutes of debrief



The NEW code team

- After restructuring: 15 member team
  - 2 respiratory therapists (PICU, CICU, or RRU)
  - 2 PICU RNs (one to record, one at the med cart)
  - 1 CICU RN (at the med cart)
  - 1 ED RN (to administer meds)
  - 1 ED paramedic (to run compressions)
  - 1 pharmacist (to help at the med cart)
  - 6 residents (each assigned to a different role, i.e. team leader, compressions, airway, etc.)
  - 1-2 PICU fellows (team leader and airway help)

The NEW Code Team

- However, despite restructuring, code team members:
  - come from multiple locations throughout the hospital
  - may never have met or worked together
- Different paradigm for each group, i.e. a code run in the ED might be different from a code run in the PICU/CICU

Sometimes idle comments help

- During our process improvement, our nurse educator said:
- *Does the code team ever all train together?*
- Mock codes were standard, but half of focus is floor team response, they are brief and often as chaotic as real codes

How can we train the code blue team?

- Ideally:
  - Multi-disciplinary
  - In-situ
  - High fidelity
  - Regularly scheduled
  - Brief enough to be done during the work day but long enough to be meaningful

Code Team Training

- Began in January 2014
- Held 1-2 times per month for both day and night shift in an available hospital room
  - Session lasts thirty minutes
  - Run it as if code already called, team has responded, and assumed their roles
  - Time to run a mock scenario and debrief, ***emphasizing positioning, teamwork, communication, and each team member knowing their role***
  - Each in-situ scenario is similar to allow for comparison between sessions

Code Team Training

How do we assess performance?

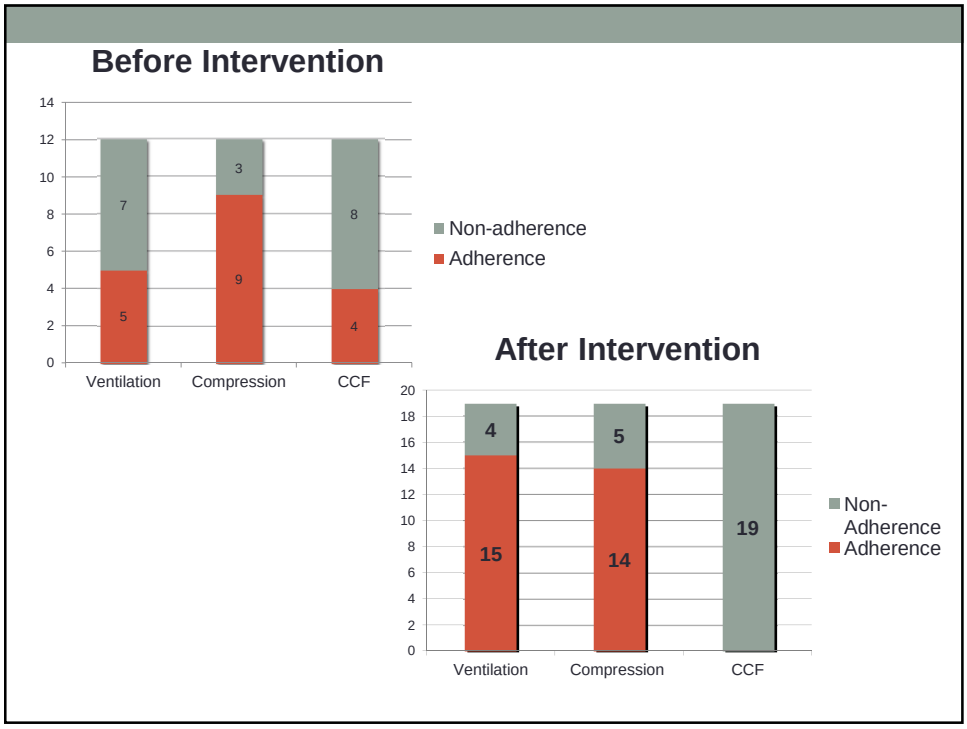
- Each session filmed using two portable GoPro cameras positioned throughout the room
- Each video reviewed by three reviewers for adherence to five American Heart Association Guidelines
  - Use of a backboard
  - Use of a team leader
  - Compression rate of 100-120
  - Chest compression fraction >80%
  - Respiratory rate less than 12 per minute
- How did we do?

Preliminary Results: June-Dec 2014

- 12 videotaped sessions
- We were 100% compliant with team leader use and backboard use
- Only one of twelve sessions adhered to all AHA guidelines
- What needed to improve, how could we enact improvement?
  - Noted that paramedic was hesitant to give compression feedback to residents
  - Switched paramedic out and made compression team three residents
  - Implemented just-in-time training before each session: coaching, timing, goal of minimizing interruptions maximizing time on chest, etc

Results January 2015-December 2015

- Twenty four sessions completed; 19 sessions filmed
  - None of the nineteen sessions adhered to all five AHA guidelines
  - All sessions utilized a backboard and team leader



Results

- We failed to consistently demonstrate adherence to AHA guidelines
  - Actually performed worse for chest compression fraction after implementation of code team changes

However…

- Of note, although the 2013 AHA guidelines target a CCF of >80%, the 2015 AHA guidelines suggest a CCF of >60% which we did consistently adhere to
- Using this definition, 9 of 19 post-intervention sessions would adhere to AHA guidelines vs. 3 of 12 pre-intervention

And…

- Subjective improvement:
  - repeated drug errors and issues with identification of code team members have been identified and improved
  - improvement in:
    - optimal positioning
    - crowd control
    - utilization of space in the room
    - code team members knowing their roles and fulfilling them appropriately—residents knowing how to use the defibrillator!
    - communication between code team members
  - more reliably conducted consistent training on night shift

Another area for improvement: Code Activation

- Prior to 2013 – Voice pagers, dedicated paging transmitter owned by hospital
- 90 seconds from cord pull, for voice page to be generated
- Average 10 seconds from sending of voice page to receiving it on pager
- Average response time of code team 90 seconds
- So average 3:10 from code being called to team arriving

Our transition

- Digital pagers
- Direct activation from switch pull
- 10 second delay, still 90 second code team response
- Decreased code team response from 3:10 to 1:40
- Cost: no intermediary to prevent false alarms
- Benefit: code team gets lots of exercise

Discussion Points

- Who responds to code blue activations at your institution? Does this vary between the critical care units and the general medicine floors?
- What methods do you have in place for training the code blue team at your institution?
- Do the training methods discussed today seem applicable to your institution?
- What barriers do you foresee in beginning these training programs? What resources are already available or still needed?
- What methods are you using or would like to use to assess effectiveness of your code team?