High Reliability in Trauma Resuscitation

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Learning Objectives

• Describe a model of teamwork during trauma resuscitation focused on improving safety and reliability practices
• Describe the trauma time out process utilized in modeling safety behaviors
• Provide participants with actionable tools and processes to improve safety and reliability in their own facility

Disclosure Statement

• No financial conflict of interest relative to this educational activity.

ACS and State of Michigan Level 1 Pediatric Trauma Center
Annual volume approx 650
• 50+ level 1 activations
• 90+ level 2 activations
Two points of entry
• Pediatric ED, adult ED
Residency program trauma rotation

ACS and State of Arizona Level 1 Pediatric Trauma Center
Annual volume approx 2600+
• 100+ level 1 activations
• 500+ level 2 activations
New Emergency Department
Residency program
Trauma page goes out…

Level 1 13yo male from scene of MVC rollover, GCS 11, deformity to left leg, ETA 10min

Why does this happen?

Patient factors
System factors
Human factors

A chaotic environment…

• Complex patients with unknowns
• Variable team composition
• Confined space
• Multiple handoffs
• Large crowds and noise
• Brownian motion

...which led to…

• Communication fails
• Errors
• Misses in handoffs
• Derailing of process flow, delays
• Team breakdown
• Mass confusion
• Frustration and burnout

“All great changes are preceded by chaos.”
Deepak Chopra
Human Factors in Trauma

The Amygdala

The human factor: the critical importance of effective teamwork and communication in providing safe care

Optimism bias

Useful for simple emergencies

Not helpful in complex emergencies

Use of clear references and simulation training

Bystander Effect

“Will someone do _______?” is BAD!

1. Identify someone by name or role for specific task
2. Ask for a follow-up in a specific amount of time (PALS)
3. Assign someone to assign someone

Effective leadership

“Cooks in the Kitchen”

Presence of multiple experts or leaders decreases the effectiveness of the team

 Defined role

Cooperation and resource management

Communication and interaction

Assessment and decision making

Situational awareness

Coping with stress

Role of the amygdala

Responsible for “fight, flight, or freeze”

Cooks in the Kitchen

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Optimism bias

“We’re good!”

Leads to lack of preparation

Standardize preparation with checklists

Authority gradient

Power distance between perceived leaders and team members

Reduce/remove the gradient

Bystander Effect

Demonstrated in research of lay responders

In hospitals, factors include:

- Number of people around
- Degree of responsibility felt by participant
- Whether decisions are needed vs direct action
- Training
- Priming a social context and cohesiveness

Communication

<table>
<thead>
<tr>
<th>Fails</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-ended requests</td>
<td>Direct requests</td>
</tr>
<tr>
<td>“Hint and Hope”</td>
<td>Direct statements</td>
</tr>
<tr>
<td>Reluctance to speak up</td>
<td>Make it safe &amp; support the team</td>
</tr>
<tr>
<td>Reception/comprehension</td>
<td>3-way repeat back</td>
</tr>
<tr>
<td>Many channels of communication</td>
<td>Coordinated communication</td>
</tr>
</tbody>
</table>

Pre-implementation Survey

- 197 respondents from all disciplines
- Role delineation
- Preparation
- Prioritization
- Teamwork
- Safety

High Reliability

1. Sensitivity to operations and systems
2. Reluctance to simplify
3. Preoccupation with failure
4. Deference to expertise
5. Resilience

From Becker's Hospital Review, April 29, 2013

Trauma Time Out

- Phase 1 – Pre-Arrival
  - Trauma team badges in, PPE & lead on
  - Trauma RN provides pre-hospital briefing of patient to team
  - Team Lead identifies themselves, “role” call
  - All present and ready, excuses extras (stickers)
  - Minimizes noise
  - Team Lead shares plan and potential problems

Confirmation of Team & PTA information
Crowd Control

Roles and Responsibilities

Planning

Trauma Time Out

EMS Handoff

Trauma Team Level 1 Activation Essential Personnel

Phase 2 – Arrival
- "I'm the Team Lead, I'll take report."
- "60 seconds of silence" for EMS report
- IMIST-AMBO
- O&A
- Team follows ATLS protocol
- Communication – 3 way repeat back
- Voice concerns
Trauma Time Out

- Phase 3 – Post resuscitation
  - Team leader communicates to the team
  - Current diagnoses
  - Patient disposition
  - Any change in status
  - Ready to go?
  - Physician and nurse handoffs

Hardwiring safety behaviors

Standardizing best practices
Tools and references
Checklists
Practice with feedback

Biological process of learning: hard wiring
Hardwiring all aspects of the process

Simulation
- In Situ
- Multidisciplinary
- Surgeons
- ED attendings
- Residents
- Nursing
- Pharmacy
- Lab/RT/Rad
- Chap/MSW

Simulation
- Non-Technical Skills:
  - Communication and interaction
  - Leadership
  - Cooperation and resource management
  - Assessment and decision making
  - Situational awareness and coping with stress

*ACS/APS Surgical Skills Curriculum for Residents, Phase III
Simulation

- Technical Skills:
  - Primary survey (ATLS)
  - Medication-assisted intubation
  - Diagnostic interpretation (FAST, iStat, radiographs, etc)
  - IO placement
  - Fluid resuscitation
  - Blood administration/massive transfusion
  - Chest tube placement

Post-implementation Survey

- N=122
- Role delineation
- Preparation
- Prioritization
- Teamwork
- Safety
Post-implementation Survey

- N=122
- TTO
- Simulation
- TTO occurs
- TTO positive

Auditing

- Lean methodology
- Kimishibai cards
- Pareto analysis
- Changes to the flowsheet

Auditing

- Video Taping in the Trauma Bay
  - For PI use only
  - Password protected security
  - DVR overwriting (90 day limit)
  - Legal/risk approved
  - Analytics
  - Review checklist under development

Summary

- Resuscitations are very high risk
- Understanding team dynamics is key
- Team resilience can be developed
  - Effective tools
  - Hardwiring safety behaviors
  - Practice based learning