SaFE CARE:
Simulation for Effective Child Assessment and Response in Trauma

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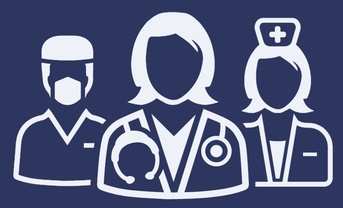


Measuring team performance during trauma simulations can identify threats to patient safety.

Highlights

- Measuring team performance during trauma simulations can identify system-level threats to patient safety.
- We used a novel teamwork evaluation tool to assess team performance during in situ pediatric trauma simulations.
  - The tool is a **modified behaviorally anchored rating scale (BARS)**
- Teams performed well on emotional regulation, but poorly on planning and coordination. Other clinical variables were tracked over time.
- Results from the team performance assessment can be used to guide quality improvement projects and to improve patient safety.

Background

- The complexity of pediatric trauma care increases risk of medical error and preventable adverse outcomes for patients.
- Simulation can realistically recreate trauma scenarios and uncover latent threats to patient safety at the team, unit, and system level.
- Team performance directly impacts patient care, but accurately measuring team performance during simulations can be challenging.
- We used a **novel teamwork evaluation tool** to assess team performance and identify system threats during in situ pediatric trauma simulations.

Methods

- Fifteen in situ pediatric trauma simulations were executed in the pediatric emergency department over sixteen months.
- Team performance was evaluated with a novel behaviorally anchored rating scale (BARS)
- Teams were evaluated on leadership, information gathering and sharing, planning, role assignment, monitoring, coordinating, and communication skills. Clinical variables, including fluid delivery method and time-to-transfusion, were also tracked.
- To measure inter-rater reliability, 20% of videos were coded by two independent raters. Descriptive statistics were computed for all outcomes.

Results

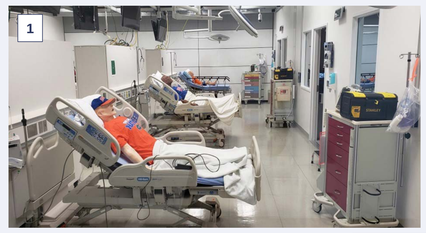
- Team performance scores (mean[SD]) were lowest in the domains of information sharing (1.8[0.93]), planning (1.7[0.73]) and coordination (1.4[0.83]). Performance was highest in the skill of emotional regulation (2.9[0.35]).
- Leaders who asserted control throughout the event had higher average team performance on all skills than those who did not.
- The measured time-to-transfusion decreased over time, possibly due to increased emphasis on timeliness by the emergency department during the time of study. Conversely, there was decay noted in the utilization of an optimal fluid delivery method.
- Overall team performance improved over time. Inter-rater agreement across all items was 93%.

Conclusion

- Evaluating team performance during in situ trauma simulations is an effective way to assess performance improvement and identify potential safety threats. Further study is needed to determine the relationship between specific team processes and patient care.
- The deficiencies identified during these simulations will be used to guide future quality improvement efforts and to support UF Shands Children's Hospital as they become a Level 1 Pediatric Trauma Center.

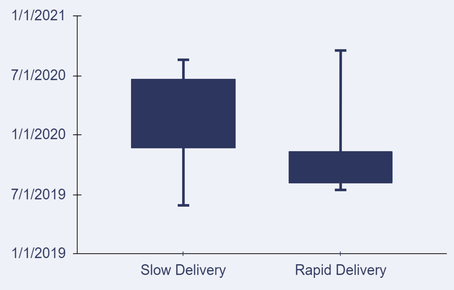
BARS Items

		2019-5-30	2019-7-16	2019-7-24	2019-8-6	2019-8-21	2019-9-11	2019-9-19	2019-10-8	2019-11-20	2019-11-25	2020-2-19	2020-6-17	2020-7-21	2020-8-19	2020-9-16
	Assumes team leader role	3	3	3	3	4	3	3	3	3	3	4	4	4	4	4
Team Leadership	Asserts control through event	4	2	4	3	4	4	4	3	3	4	4	4	3	4	4
Information Gathering and Sharing	Information gathering	3	3	3	3	3	3	4	3	3	3	4	4	4	4	4
	Information sharing	2	2	3	4	4	4	3	2	2	2	2	4	4	4	4
Planning	Sets initial plan	3	2	3	2	4	2	2	2	3	3	2	3	4	4	4
	Contingency planning	3	2	2	2	2	2	2	2	2	2	2	2	2	2	4
	Reactive planning	3	2	3	3	3	3	3	4	3	3	4	3	3	3	4
Role Assignment and Back-up	Assigns or assumes roles	3	3	3	3	3	3	3	3	3	2	3	3	3	3	4
	Back-up behavior	3	3	4	4	3	3	3	4	4	4	3	3	3	4	4
Monitoring	System monitoring	4	2	3	4	3	4	2	4	4	4	3	4	3	4	4
	Monitoring progress	3	3	3	3	3	3	3	3	3	3	4	3	3	3	4
Coordinating	Coordination	4	2	3	2	2	2	2	2	2	2	4	2	2	2	4
Communication	Emotional regulation	4	3	4	4	4	4	4	4	4	4	4	4	3	4	4
	Closed loop communication	3	2	3	3	2	2	3	2	3	3	4	3	3	3	4

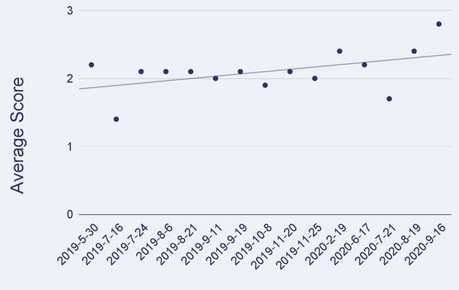


Photos from Simulations -

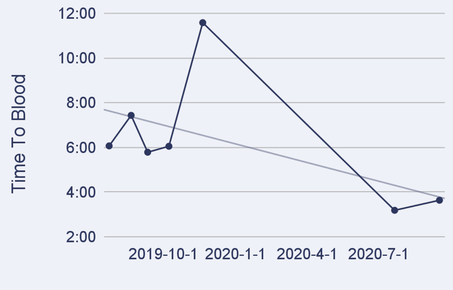
1. Experiential Theater in the Harrell Medical Education Building with several mannequins.
2. Finding a carotid pulse on a mannequin.
3. In-situ simulation set-up in the MICU. During in-situs, learners can practice in their daily work areas with their own tools and equipment.



Fluid Delivery - Administration of fluid bolus got slower over time.



Average Score - Average score of simulations increased over time. (r^2= 0.23)



Transfusion Time - Time to blood transfusion decreased over time. (r^2= 0.31)