CHOC Children's. Nursing Research

CHOC Children's Hospital
Best Evidence and Recommendations

Simulation to Improve Interprofessional Communication and Collaboration

Stacey Bass, DNP, RN, CPN, PNP
sbass@choc.org

PICO(T): Does the use of in situ simulation improve interprofessional communication and collaboration among health care providers performing pediatric trauma care?

P (Population/problem): pediatric patients/health care providers
I (Intervention/issue) : in situ simulation
C (Comparison):
O (Outcome): improve interprofessional communication and collaboration
T (Timeframe): during pediatric trauma care

Background:
Pediatric trauma is a leading cause of morbidity and mortality (Krug & Tuggle, 2008). Pediatric trauma care involves both high stakes and time-sensitive care that can potentially impact patient safety (Krug & Frush, 2007). Gruen, Jurkovich, McIntyre, Foy, and Maier (2006) found that one third of errors leading to trauma deaths occur in the initial emergency department (ED) setting.

Opportunities remain to continually improve and advance emergency/trauma practices to ensure both safe and high-quality delivery of patient care for every patient every time. Patients demand high quality and individualized care without errors. Government and accrediting agencies expect high quality and cost-effective care (Makic & Wald, 2017). Meeting these expectations requires focused effort by the whole team: Administration and all healthcare providers (e.g. physicians, nurses, pharmacists, therapists).

Patient safety is a critical outcome of collaborative practice. Interprofessional education (IPE) is a method to prepare healthcare providers for roles in interprofessional collaborative practice (Reising et al., 2017). Two competency domains, communication and teamwork, are stressed by the Interprofessional Education Collaborative (IPEC) that identify the knowledge, behaviors, and attitudes desirable in interprofessional healthcare teams to promote safe practice (IPEC, 2016). The Institute of Medicine (IOM) highlights the role of interdisciplinary communication in the prevention of errors in healthcare (IOM, 2015). As a result, interprofessional communication is a focus of the Joint Commission Patient Safety Goal.

In situ trauma simulation has been used to evaluate the quality of trauma care in a reproducible and realistic fashion (Auerbach et al., 2014; Bayouth et al., 2018; Falcone et al., 2008; Holcolmb et al., 2002). The use of simulation to educate and evaluate a trauma team increases shared learning, insight into teamwork, skills in team communication, interaction, and collaboration between professionals (Garbee et al., 2013; Gjeraa et al., 2014; Jakobsen et al., 2018; Miller et al., 2012; Reising et al., 2017). Debriefing after a simulation provides the opportunity for teams to reflect on their performance safely with directed feedback from facilitators.

©2018 CHOC Children's. 1201 West La Veta Ave., Orange, CA 92868

Many children's hospital across the nation have invested and incorporated the use of simulation into the routine training of their health care providers. Currently, CHOC Children's has used simulation to practice mock codes and procedures but has not immersed a team of health care providers in caring for a diverse range of patient scenarios specific to unit and specialized populations.

The purpose of this evidence-based practice project is to present comprehensive literature review findings that support the practice of in situ simulation to improve upon interprofessional communication and collaboration among health care providers. It is recognizing the importance of inter-professionalism among the pediatric trauma care team to improve patient outcomes. It is also identifying the associated barriers and challenges to interprofessional communication and collaboration among the pediatric trauma team, and savings of financial cost, time, and resources for the hospital by reducing patient morbidity and mortality.

Search Strategies and Databases Reviewed:

- Databases searched for this review included CINAHL, Medline in EBSCO, Pub Med and ScienceDirect. Key search words: simulation, pediatric patients, trauma, interprofessional communication, and collaboration. This search yielded 23 articles.
- Websites reviewed included the American Academy of Pediatrics, Interprofessional Education Collaborative, Pediatric Trauma Society, Institute of Medicine, and Joint Commission.
- A listserv survey through the *Society of Pediatric Nurses* was sent to pediatric nurses from key children's hospitals across the nation regarding this topic. This survey yielded (0) responses. Personal email correspondence occurred with Dr. Falcone and the simulation/education team from Cincinnati Children's Hospital.

Synthesis of Evidence:

- Several studies from 2008-2018 provided evidence that use of in situ simulation improves interprofessional communication and collaboration among health care providers. Literature review was narrowed down to a critical appraisal of 14 studies.
- Studies vary in their sample population, including both licensed health care professionals and health care student participants.
- Indication for in situ simulation varied in the studies as well, ranging from simulation-based training to improve health care provider performance in emergency or trauma situations, in situ simulation to improve overall teamwork and communication, and use of simulation as an educational intervention to support interprofessional collaboration.
- Some of the studies targeted obstetrical patients, adult trauma patients, and pediatric trauma patients, and some were a mixed sample, or non-specific.
- CHOC's Customer Service department identified communication as a top concern for the organization based on patient and family engagement survey results.
- Cumulative findings of the 14 studies support the implementation and practice of simulation to improve interprofessional communication and collaboration among health care providers.
- An integrative review of the literature (Foronda et al., 2016) consisted of 18 research studies, six short papers, three literature reviews, and one theoretical framework. Research suggests that interprofessional communication skills can significantly improve with training, including use of simulation and standardized communication tools.
- A recent pre-posttest design and mixed methods study (Bayouth et al., 2018) sought to identify targets for educational intervention at three academic level 1 trauma centers, and to increase provider experience via pediatric trauma simulations and debriefings. Results indicated that provider comfort improved with multiple trauma skills (p-values < 0.5) and team

©2018 CHOC Children's. 1201 West La Veta Ave., Orange, CA 92868

performance also improved significantly after simulation experiences (p-value = 0.001). Qualitative analysis of comments from focus groups found participants felt that simulation scenarios improved teamwork, participant confidence levels increased in handling pediatric traumas, and communication between level one trauma center and regional hospitals improved.

- Auerbach et al. (2014) completed a 2-year pre-posttest design longitudinal cohort study aimed to evaluate feasibility and measure the impact of an in situ interdisciplinary pediatric trauma quality improvement simulation program. A trend analysis of 22 simulations found significant upward trend for overall performance and teamwork (p-value = 0.002). Results also found 251/398 (63%) of participants reported that debriefing was the most valuable aspect of simulation.
- In situ trauma simulation has been shown to be a sustainable and effective method to reinforce teamwork and trauma skills, as well as improve interprofessional communication, as demonstrated in the literature.
- Strong interprofessional communication reinforces CHOC's Power of Alignment, supporting aligned values, behaviors, standards, staff, and leadership.
- Effective interprofessional communication and collaboration also reinforces CHOC's Patient and Family Centered Care (PFCC) principles of dignity/respect, information sharing, collaboration, participation, and partnership among the health care professional team.

Practice Recommendations:

- Interprofessional simulation scenarios should be created by content experts, incorporating the Interprofessional Collaborative Practice (IPC) 2016 Core Competencies.
- Trauma scenarios should be based upon actual cases previously evaluated and treated at an institution.
- Participants should include trauma care providers who respond to pediatric trauma activations of critically injured simulated patients. Staff members within the department should include both clinical and non-clinical personnel: Registered Nurses, Physicians (students, residents, fellows, attendings), EMTs, clergy, hospital security, social worker, child life, diagnostic imaging, respiratory therapist, pediatric surgery, pediatric emergency medicine, anesthesia, neurosurgery, orthopedics, trauma, blood bank, transport, and PICU.
- Institutions need to evaluate what necessary simulation equipment/technology and simulation specific personnel is required to implement interprofessional simulations.
- Simulation scenarios should run for approximately 20 minutes.
- Debriefing sessions immediately follow the simulation for 30 minutes, and should include focusing on teamwork/collaboration, communication, and any gaps in trauma care noted by the facilitators.
- The debriefings should be led by experienced simulation personnel using the 3-phase debriefing framework (reactions, understanding/reflection, and summary) and use the Center for Medical Simulation's: *Debriefing with Good Judgment* framework (Rudolph et al., 2007).
- Tools of measurement may include using:
  - Performance Assessment Tool for Interprofessional Communication and Teamwork (PACT)-Video Tool (Chui, 2014).
  - Interprofessional Collaborative Competency Attainment Survey (ICCAS) by Archibald, Trumpower and MacDonald (2014).
- Length of study/Evaluation: (1-year period), interprofessional team performance during simulation is compared during the first 4 months of study (the early group), and the last 4 months (the late group).
- Videos from the simulated scenarios should be reviewed and scored by 2-3 expert reviewers. Reviewers should be blinded as to whether the videos came from the early or late group.

©2018 CHOC Children's. 1201 West La Veta Ave., Orange, CA 92868

Evidence-Based Practice Follow Up:

- Collect data on simulations completed with pediatric trauma care team.
- Review data collected to determine whether use of situ simulation to practice pediatric trauma care improves interprofessional communication and collaboration among the healthcare team.
- Determine what barriers or challenges there are to improving interprofessional practice.
- Compare first (4 months) simulations with second (4 months) simulations to note any changes in outcomes.
- Will consider synthesizing data collected to compose an article for future journal submission.

Acknowledgements:

- The Evidence-Based Scholars Program was supported by a grant from the Walden and Jean Young Shaw Foundation
- Vicky R. Bowden, DNSc, RN, Azusa Pacific University, CHOC Children's Hospital EBP Scholars Mentor.
- Jennifer Hayakawa, DNP, PCNS-BC, CNRN, CCRN, Nurse Scientist, CHOC Children's.

Bibliography:

Archibald, D., Trumpower, D., & MacDonald, C. J. (2014). Validation of the interprofessional collaborative competency attainment survey (ICCAS). *Journal of Interprofessional Care*, *28*(6), 553-558.

Bayouth, L., Ashley, S., Brady, J., Lake, B., Keeter, M., Schiller, D., ... & Longshore, S. W. (2018). An in-situ simulation-based educational outreach project for pediatric trauma care in a rural trauma system. *Journal of pediatric surgery*, *53*(2), 367-371.

Chiu, C. J. (2014). *Development and validation of performance assessment tools for interprofessional communication and teamwork (PACT)* (Doctoral dissertation).

Falcone Jr, R. A., Daugherty, M., Schweer, L., Patterson, M., Brown, R. L., & Garcia, V. F. (2008). Multidisciplinary pediatric trauma team training using high-fidelity trauma simulation. *Journal of pediatric surgery*, *43*(6), 1065-1071.

Garbee, D. D., Paige, J. T., Bonanno, L. S., Rusnak, V. V., Barrier, K. M., Kozmenko, L. S., ... & Nelson, T. K. (2012). Effectiveness of teamwork and communication education using an interprofessional high-fidelity human patient simulation critical care code. *Journal of Nursing Education and Practice*, *3*(3), 1.

Gjeraa, K., Møller, T. P., & Østergaard, D. (2014). Efficacy of simulation-based trauma team training of non-technical skills. A systematic review. *Acta Anaesthesiologica Scandinavica*, *58*(7), 775-787.

Gruen, R.L., Jurkovich, G.J., & McIntyre, L.K., Foy, H.M., & Maier, R.V. (2006). Patterns of errors contributing to trauma mortality: Lessons learned from 2594 deaths. *Annals of Surgery, 244*(3), 371–380.

©2018 CHOC Children's. 1201 West La Veta Ave., Orange, CA 92868

Holcomb, J. B., Dumire, R. D., Crommett, J. W., Stamateris, C. E., Fagert, M. A., Cleveland, J. A., ... & Aoki, N. (2002). Evaluation of trauma team performance using an advanced human patient simulator for resuscitation training. *Journal of Trauma and Acute Care Surgery*, *52*(6), 1078-1086.

Institute of Medicine. (2015). *Measuring the impact of interprofessional education on collaborative practice and patient outcomes*. doi:10.17226/21726

Interprofessional Education Collaborative. (2016). *Core competencies for interprofessional collaborative practice: 2016 update.* Washington DC: Interprofessional Education Collaborative. IPEC-2016-Updated-Core-Competencies-Report_final_release_pdf.

Jakobsen, R. B., Gran, S. F., Grimsmo, B., Arntzen, K., Fosse, E., Frich, J. C., & Hjortdahl, P. (2018). Examining participant perceptions of an interprofessional simulation-based trauma team training for medical and nursing students. *Journal of interprofessional care*, *32*(1), 80-88.

Krug, S.E., & Frush, K. (2007). Patient safety in the pediatric emergency care setting. *Pediatrics, 120*, 1367–1375.

Krug, S.E. & Tuggle, D.W. (2008). Management of pediatric trauma. *Pediatrics, 121*, 849–854.

Makic, M. B. F., & Wald, H. (2017). Achieving improved patient outcomes through interprofessional teams. *Journal of Interprofessional Education & Practice*, *8*, 91-94.

Miller, D., Crandall, C., Washington III, C., & McLaughlin, S. (2012). Improving teamwork and communication in trauma care through in situ simulations. *Academic Emergency Medicine*, *19*(5), 608-612.

Reising, D. L., Carr, D. E., Gindling, S., Barnes, R., Garletts, D., & Ozdogan, Z. (2017). An analysis of interprofessional communication and teamwork skill acquisition in simulation. *Journal of Interprofessional Education & Practice*, *8*, 80-85.

Rudolph, J.W., Simon, R., Rivard, P., Dufresne, P., Ronald L.; Raemer, Raemer, D.B. (2007). Debriefing with good judgment: Combining rigorous feedback with genuine inquiry. *Anesthesiology Clinics, 25*(2), 361-367.

The Joint Commission. Sentinel event data. Root causes by event type: 2004–2014. Available at: https://www.jointcommission.org/assets/1/18/Event_Type_by_Year_19952015.pdf (accessed 11 October 2017).

©2018 CHOC Children's. 1201 West La Veta Ave., Orange, CA 92868