



Article

Identifying Barriers to Pediatric Trauma Resuscitation: A Cross-Disciplinary Needs Assessment and Evidence-Informed Quality Improvement Framework

Ryan Thomas Davis ^{1,2,*}, Erica Surman ¹, Begum Akay ^{1,2}, Nathan M. Novotny ^{1,2}, Anthony Stallion ^{1,2} and Pavan Brahmamdam ^{1,2}

¹ Corewell Health Children's, William Beaumont University Hospital, Royal Oak, MI 48073, USA; erica.surman@corewellhealth.org (E.S.); begum.akay@corewellhealth.org (B.A.); anthony.stallion@corewellhealth.org (A.S.); pavan.brahmamdham@corewellhealth.org (P.B.)

² William Beaumont School of Medicine, Oakland University, Rochester, MI 48309, USA

* Correspondence: davis3rt@gmail.com

Abstract

Background/Objectives: Pediatric trauma resuscitation requires rapid, coordinated interdisciplinary teamwork; however, communication and organizational challenges frequently impede effective performance. This study aimed to characterize cross-disciplinary perceptions of barriers encountered during pediatric trauma activations and to contextualize these findings within an evidence-based quality improvement framework. **Methods:** We conducted a single-center, cross-sectional, anonymous electronic survey at a Level II pediatric trauma center within a tertiary adult hospital. Participants included attending and resident physicians, nurses, respiratory therapists, technicians, and ancillary staff involved in pediatric trauma activations. A 22-item survey assessed leadership, audibility, closed-loop communication, role clarity, crowding, and overall coordination. Descriptive statistics summarized responses, and free-text responses were reviewed thematically. **Results:** Sixty-seven team members responded (attending physicians $n = 12$, residents $n = 15$, nurses $n = 22$, respiratory therapists/technicians $n = 18$). Overall, 82% reported that crowding interfered with resuscitations, while only 6% rated leaders as very effective at managing crowding. Difficulty hearing the team leader (60%) and peers (66%) was common. Roles were always defined for 16% of respondents, and consistent use of closed-loop communication was reported by 24%; 3% were unfamiliar with the concept. More than half of respondents (54%) reported excessive personnel during activations. **Conclusions:** Pediatric trauma team members identified crowding, poor audibility, role ambiguity, and inconsistent structured communication as barriers to effective resuscitation. These findings support targeted quality improvement strategies, including team-size management, reinforcement of closed-loop communication, checklist use, and recurring in situ simulation with structured debriefing.



Academic Editor: Zsolt J. Balogh

Received: 1 February 2026

Revised: 8 May 2026

Accepted: 16 July 2026

Published: 29 July 2026

Copyright: © 2026 by the authors.

Licensee MDPI, Basel, Switzerland.

This article is an open access article distributed under the terms and conditions of the [Creative Commons Attribution \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) license.

Keywords: pediatric trauma; resuscitation; teamwork; communication; quality improvement; simulation

1. Introduction

Pediatric trauma remains a leading cause of morbidity and mortality in children worldwide and represents a major public health burden, requiring rapid, coordinated responses from interdisciplinary healthcare teams [1,2]. Trauma resuscitations are among

the most time-sensitive and cognitively demanding clinical events, in which outcomes depend not only on technical expertise but also on effective communication, leadership, and team organization [3–5]. Although activation protocols are designed to standardize care, their effectiveness is frequently undercut by operational inefficiencies, including crowding, unclear role delineation, poor audibility, and inconsistent use of closed-loop communication [3–5]. The prior pediatric trauma systems literature has additionally emphasized that coordinated multidisciplinary trauma response processes are essential components of effective pediatric emergency and trauma care systems [6]. These latent safety threats can delay critical interventions and degrade overall team performance. Our institutional survey confirmed that these challenges are shared across physicians, nurses, respiratory therapists, and ancillary staff, suggesting that they represent systemic rather than individual problems.

A growing body of research has identified practical strategies to address these challenges, though optimal implementation remains debated. Simulation-based training with structured debriefing improves non-technical skills and adherence to trauma protocols, while closed-loop communication has been shown to shorten time-to-task completion and improve clarity during pediatric trauma resuscitation [7,8]. Interprofessional simulation-based team training enhances collaboration and role clarity across disciplines [9]. In situ trauma simulation and trauma video review reliably identify latent safety threats and inform targeted safety improvements [10,11]. “Boot camp”-style pediatric trauma curricula improve teamwork, knowledge, and provider confidence, particularly for rotating or newly integrated clinicians [12]. Current resuscitation education guidelines emphasize structured briefings and debriefings, explicit role assignment, and reinforcement of communication behaviors as essential components of effective team performance [13]. However, variation persists across institutions regarding team size, communication fidelity, and adoption of these strategies, underscoring the need for context-specific evaluation.

Building on these insights, the objectives of this study were to (1) quantify cross-disciplinary perceptions of pediatric trauma activation challenges and (2) situate these findings within an evidence-based framework to guide institutional quality improvement initiatives. Consistent concerns regarding crowding, audibility, role clarity, and structured communication were identified, highlighting issues that may be relevant to pediatric trauma teams beyond our institution and informing future quality improvement initiatives.

2. Materials and Methods

2.1. Study Design and Setting

This was a single-center, cross-sectional survey conducted at Corewell Health Children’s at William Beaumont University Hospital, a high-volume pediatric trauma center verified as a Level II children’s trauma center within a tertiary adult hospital. The project was undertaken as part of an institutional quality improvement initiative aimed at identifying barriers to effective pediatric trauma team performance.

The study was reviewed by the Corewell Health Institutional Review Board and was determined to be exempt from human subject oversight (IRB protocol#2025-101), as no patient-level data were collected and participation was anonymous.

2.2. Participants

Eligible participants included healthcare professionals routinely involved in pediatric trauma activations, including attending and resident physicians, trauma nurses, respiratory therapists, radiology technicians, and ancillary trauma bay staff. Participants were recruited through institutional email distribution lists. Participation was voluntary, and no incentives were provided.

2.3. Survey Development

A 22-item electronic survey was developed to assess perceptions of pediatric trauma resuscitation performance across key domains, including leadership, communication clarity and audibility, use of closed-loop communication, role definition and visibility, crowding and trauma bay logistics, and overall team coordination. Survey items were informed by prior literature on trauma communication, simulation-based education, and human factors in emergency care.

To improve clarity and content validity, the survey was piloted with five multidisciplinary trauma team members prior to distribution, and minor revisions were made based on feedback. The final survey included Likert-scale, binary, and open-ended questions. Survey items were designed to permit a single response per participant using predefined response categories appropriate to the question type.

2.4. Data Collection

The survey was distributed electronically using Microsoft Forms (Microsoft Corporation, Redmond, WA, USA), a secure, web-based platform. The survey remained open for four weeks. Responses were anonymous, and no identifying information was collected. Participants were able to skip questions, and incomplete surveys were included in the analysis.

2.5. Data Analysis

Survey responses were summarized using descriptive statistics. Responses were analyzed descriptively according to their predefined response categories. For concise presentation within Table 1, selected survey items display respondents selecting the most affirmative response category (e.g., ‘always’ or ‘very effective’). Categorical variables were reported as frequencies and percentages, both overall and stratified by professional role. No inferential statistical testing was performed, consistent with the quality improvement and exploratory nature of the study. Free-text responses were reviewed using thematic analysis to identify recurring concepts that complemented quantitative findings. Data analysis was performed using Microsoft Excel (Microsoft Corporation, Redmond, WA, USA).

Table 1. Cross-Disciplinary Perceptions of Pediatric Trauma Resuscitation Barriers.

Response Area	Attending (n = 12)	Resident (n = 15)	Nurse (n = 22)	RT/Tech (n = 18)	Total (n = 67)
Crowd control is a problem	10/12	13/15	18/22	14/18	55/67
Leader effective at crowd control	1/12	1/15	1/22	0/18	3/67
Difficulty hearing leader	7/12	10/15	14/22	10/18	41/67
Difficulty hearing peers	8/12	10/15	15/22	10/18	43/67
Roles always clearly defined	2/12	2/15	4/22	2/18	10/67
Closed-loop communication always used	3/12	3/15	6/22	4/18	16/67
Unfamiliar with closed-loop communication	0/12	0/15	1/22	2/18	3/67
Too many people present	6/12	8/15	12/22	10/18	36/67
Team communication very effective	2/12	2/15	3/22	2/18	9/67

Values represent the number of respondents selecting the most affirmative response category for each survey item relative to the total number of respondents within each professional group.

3. Results

3.1. Respondent Characteristics

Sixty-seven trauma team members responded to the survey, including attending physicians (n = 12), resident physicians (n = 15), nurses (n = 22), and respiratory therapists or technicians (n = 18). Respondents represented all major professional roles routinely involved in pediatric trauma activations at the institution (Table 1).

3.2. Crowd Control and Team Size

Across disciplines, crowd control was the most frequently reported concern. Eighty-two percent of respondents reported that crowding interfered with pediatric trauma resuscitations, and only six percent rated trauma leaders as very effective at managing crowd control (Table 1). More than half of respondents (54%) reported that excessive numbers of personnel were present during trauma activations (Table 1).

3.3. Audibility and Communication

Audibility was commonly reported as a barrier to effective communication. Sixty percent of respondents indicated difficulty hearing the trauma team leader, and 66% reported difficulty hearing other team members during pediatric trauma activations (Table 1). While overall communication was generally perceived as respectful, only 15% of respondents rated team communication as very effective, with the remainder describing it as somewhat effective (Table 1).

3.4. Role Clarity and Closed-Loop Communication

Clear role delineation was inconsistently reported. Only 16% of respondents indicated that trauma team roles were always clearly defined, while the majority selected “sometimes” or “rarely” (Table 1). Closed-loop communication was reported as consistently used by 24% of respondents, and three percent reported unfamiliarity with the concept (Table 1).

3.5. Qualitative Feedback

Free-text responses aligned with quantitative findings and highlighted several recurrent themes. Respondents emphasized the need for clearer identification of team leadership, structured pre-briefing when larger teams were present, and routine post-event debriefings to reinforce learning and guide system improvement efforts.

4. Discussion

4.1. Overview of Key Findings

This cross-role survey identified consistent barriers to effective pediatric trauma resuscitation, including crowd control challenges, impaired audibility, role ambiguity, and inconsistent use of closed-loop communication. These barriers were reported across physicians, nurses, respiratory therapists, and technicians, suggesting that they reflect system-level processes within our institution rather than discipline-specific factors. These findings mirror human-factor research in emergency care demonstrating that increased personnel density and environmental noise raise cognitive load, impair coordination, and increase the likelihood of error [10,14]. Similar deficiencies in communication, coordination, and team organization have been identified during simulated pediatric trauma stabilizations across emergency departments, further supporting that these challenges are widespread within pediatric trauma systems [15]. Although this study reflects experience at a single center, the barriers identified are consistent with those reported in prior observational, simulation, and video-review studies, suggesting that similar challenges may exist in other pediatric trauma systems [4,10,11].

4.2. Crowd Control and Team Size

Crowding and team size emerged as prominent concerns. Observational and simulation studies have demonstrated that excessive headcount is associated with role confusion and delayed execution of critical tasks, whereas restricting participation to essential roles improves workflow and reliability [10,15–18]. In our study, 82% of respondents perceived crowding as problematic, and only six percent rated team leaders as very effective at managing it. These findings align with video-based analyses demonstrating a nonlinear relationship between team size and early task completion, in which both insufficient and excessive personnel degrade performance, underscoring the importance of active headcount management by team leaders [18].

4.3. Communication Structure and Closed-Loop Communication

Closed-loop communication has been shown to shorten time-to-task completion and improve clarity during pediatric trauma resuscitations [4,8]. However, real-world video reviews indicate that acknowledgment failures and overlapping speech remain common without intentional reinforcement [4]. Consistent with these observations, only 24% of respondents in our study reported that closed-loop communication was consistently used, identifying a clear and modifiable target for leadership training and team-based education.

4.4. Team Training and Debriefing

Simulation-based, multidisciplinary training programs have demonstrated improvements in teamwork ratings and objective process measures during early trauma care, particularly when combined with structured debriefing [16,17]. Interdisciplinary pediatric trauma simulation programs are feasible, highly valued by participants, and associated with sustained improvements in performance, with many teams identifying debriefing as the highest-yield component [19]. Boot-camp-style pediatric trauma curricula further support onboarding of new or rotating clinicians by improving knowledge, confidence, and simulated performance [12]. Collectively, these data support a programmatic approach that integrates brief, recurring in situ simulations with structured debriefing and onboarding curricula.

4.5. Standardization Tools

Standardization strategies, including simulation-based curricula, explicit role clarification, and checklist use, have been shown to improve performance during pediatric trauma activations [7–10,20–22]. Advanced Trauma Life Support (ATLS) checklists improve adherence to time-sensitive tasks, while role cards or visual identifiers reduce ambiguity and facilitate task delegation, particularly in larger or mixed-experience teams.

4.6. Learning from Cases

Video-assisted debriefing improves team function in simulated trauma settings, and many trauma programs now employ trauma video review to identify delays, communication failures, and adverse events during real cases [11,23]. Pediatric in situ simulation programs have similarly demonstrated that latent safety threats related to communication, workflow, and equipment access can be identified and mitigated before patient harm occurs [24]. Integrating video review with in situ simulation, closed-loop communication training, and routine briefing and debriefing creates a continuous improvement cycle that supports durable system-level change.

4.7. Environment and Audibility

Emergency department noise levels commonly range from 60–80 dB(A), exceeding recommended hospital thresholds and impairing speech intelligibility and working mem-

ory [5,25]. These conditions likely contributed to the finding that approximately two-thirds of respondents reported difficulty hearing team leaders and peers. Practical mitigation strategies include limiting non-essential personnel, optimizing room layout, closing doors when feasible, and adopting speaking protocols or audio solutions designed for high-noise environments. These interventions may synergize with structured communication and role clarification efforts.

4.8. Limitations

This study has several limitations. As a single-center survey, findings may not be generalizable to other institutions. The survey instrument, while piloted locally, was not externally validated, and responses relied on self-report, introducing potential response bias. Additionally, patient-level outcomes were not assessed. Future studies should link targeted interventions to objective process measures and clinical outcomes.

4.9. Implications for Quality Improvement

Taken together, existing evidence supports a pragmatic quality improvement bundle consisting of: (1) education and monitoring of closed-loop communication; (2) brief, recurring in situ simulations with structured debriefing; (3) active management of team size using checklists and visual role identifiers; and (4) environmental modifications to improve audibility. These findings, together with existing evidence, may inform the design of future quality improvement initiatives aimed at improving pediatric trauma team performance. At our institution, this framework is being used to guide ongoing improvement efforts.

5. Conclusions

In this single-center, cross-disciplinary survey, pediatric trauma team members identified consistent barriers to effective resuscitation, including challenges with crowd control, audibility, role clarity, and inconsistent use of closed-loop communication. These barriers were reported across all professional roles involved in pediatric trauma activations, suggesting that they represent system-level issues rather than discipline-specific shortcomings.

By situating these findings within the existing evidence base, this study highlights clear opportunities for targeted quality improvement. Interventions such as active management of team size, reinforcement of structured communication practices, use of role identification tools and checklists, and implementation of recurring in situ simulation with structured debriefing are supported by both the prior literature and the perceptions of frontline trauma team members. Future work should focus on implementing and rigorously evaluating these interventions to determine their impact on team performance, process measures, and patient outcomes.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/traumacare6030015/s1>, Supplementary File S1: Pediatric Trauma Activation Feedback Survey.

Author Contributions: Conceptualization: R.T.D. and E.S.; Methodology: R.T.D. and E.S.; Formal Analysis: R.T.D.; Investigation: R.T.D. and E.S.; Data Curation: R.T.D.; Writing—Original Draft Preparation: R.T.D.; Writing—Review and Editing: R.T.D., E.S., B.A., N.M.N., A.S. and P.B.; Supervision: N.M.N., A.S. and P.B.; Project Administration: R.T.D.; Resources: N.M.N., A.S. and P.B. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Ethical review and approval were waived for this study by the Corewell Health Institutional Review Board because the project was conducted as a quality improvement initiative and involved anonymous survey data with no patient-level information (protocol #2025-101).

Informed Consent Statement: Informed consent was waived for this study because participation involved an anonymous survey conducted as part of a quality improvement initiative, with no patient-level data collected.

Data Availability Statement: The survey instrument is provided in Supplementary File S1. De-identified aggregate data supporting the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available due to institutional policies governing internal quality improvement initiatives and to protect participant anonymity.

Acknowledgments: The authors thank the trauma team members at Corewell Health Children's at William Beaumont University Hospital for their participation and thoughtful feedback, which made this study possible. We also acknowledge Diane Studzinski for her statistical guidance and analytical support during data review and interpretation.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Bradshaw, C.J.; Bandi, A.S.; Muktar, Z.; Hasan, M.A.; Chowdhury, T.K.; Banu, T.; Hailemariam, M.; Ngu, F.; Croaker, D.; Bankolé, R.; et al. International study of the epidemiology of paediatric trauma. *World J. Surg.* **2018**, *42*, 1885–1894. [[CrossRef](#)] [[PubMed](#)]
2. Remick, K.; Gausche-Hill, M.; Joseph, M.M.; Brown, K.; Snow, S.K. Pediatric readiness in the emergency department. *Pediatrics* **2018**, *142*, e20182459. [[CrossRef](#)] [[PubMed](#)]
3. Evans, J.C.; Evans, M.B.; Slack, M.; Peddle, M.; Lingard, L. Examining non-technical skills for ad hoc resuscitation teams: A scoping review and taxonomy of team-related concepts. *Scand. J. Trauma Resusc. Emerg. Med.* **2021**, *29*, 167. [[CrossRef](#)] [[PubMed](#)]
4. Bhangu, A.; Notario, L.; Pinto, R.L.; Pannell, D.; Thomas-Boaz, W.; Freedman, C.; Tien, H.; Nathens, A.B.; da Luz, L. Closed-loop communication in the trauma bay: Identifying opportunities for team performance improvement through a video review analysis. *CJEM* **2022**, *24*, 419–425. [[CrossRef](#)] [[PubMed](#)]
5. Tijnelis, M.A.; Fitzsullivan, E.S.; Henderson, S.O. Noise in the emergency department. *Am. J. Emerg. Med.* **2005**, *23*, 332–335. [[CrossRef](#)] [[PubMed](#)]
6. Vernon, D.D.; Furnival, R.A.; Hansen, K.W.; Diller, E.M.; Bolte, R.G.; Rozycki, G.S.; Fiallos, M.; Langlais, B.T. Effect of a pediatric trauma response team on emergency department treatment time and mortality of pediatric trauma victims. *Pediatrics* **1999**, *103*, 20–24. [[CrossRef](#)] [[PubMed](#)]
7. Botelho, F.; Gerck, A.; Harley, J.M.; Poenaru, D. Improving pediatric trauma education by teaching non-technical skills: A randomized controlled trial. *J. Pediatr. Surg.* **2024**, *59*, 874–888. [[CrossRef](#)] [[PubMed](#)]
8. Abd El-Shafy, I.; Delgado, J.; Akerman, M.; Bullaro, F.; Christopherson, N.A.; Prince, J.M. Closed-loop communication improves task completion in pediatric trauma resuscitation. *J. Surg. Educ.* **2018**, *75*, 58–64. [[CrossRef](#)] [[PubMed](#)]
9. Schram, A.; Bonne, N.L.; Henriksen, T.B.; Paltved, C.; Hertel, N.T.; Lindhard, M.S. Simulation-based team training for healthcare professionals in pediatric departments: Study protocol for a nonrandomized controlled trial. *BMC Med. Educ.* **2024**, *24*, 607. [[CrossRef](#)] [[PubMed](#)]
10. Petrosioniak, A.; Fan, M.; Hicks, C.M.; White, K.; McGowan, M.; Campbell, D.; Trbovich, P. Trauma Resuscitation Using in situ Simulation Team Training (TRUST) study: Latent safety threat evaluation using framework analysis and video review. *BMJ Qual. Saf.* **2021**, *30*, 739–746. [[CrossRef](#)] [[PubMed](#)]
11. Nazir, A.; Shore, E.M.; Keown-Stoneman, C.; Grantcharov, T.; Nolan, B. Enhancing patient safety in trauma: Understanding adverse events, assessment tools, and the role of trauma video review. *Am. J. Surg.* **2024**, *234*, 74–79. [[CrossRef](#)] [[PubMed](#)]
12. Khobrani, A.; Patel, N.H.; George, R.L.; McNinch, N.L.; Ahmed, R.A. Pediatric trauma boot camp: A simulation curriculum and pilot study. *Emerg. Med. Int.* **2018**, *2018*, 7982315. [[CrossRef](#)] [[PubMed](#)]
13. Cheng, A.; Magid, D.J.; Auerbach, M.; Bhanji, F.; Bigham, B.L.; Blewer, A.L.; Dainty, K.N.; Diederich, E.; Lin, Y.; Leary, M.; et al. Part 6: Resuscitation education science: 2020 American Heart Association guidelines. *Circulation* **2020**, *142*, S551–S579. [[CrossRef](#)] [[PubMed](#)]
14. Hicks, C.M.; Petrosioniak, A. Human factors in emergency medicine and trauma: Implications for team performance. *Emerg. Med. Clin. N. Am.* **2018**, *36*, 1–17. [[CrossRef](#)] [[PubMed](#)]

15. Hunt, E.A.; Hohenhaus, S.M.; Luo, X.; Frush, K.; Lipschik, G.Y.; Helfaer, M.A. Simulation of pediatric trauma stabilization in 35 North Carolina emergency departments: Identification of targets for performance improvement. *Pediatrics* **2006**, *117*, 641–648. [[CrossRef](#)] [[PubMed](#)]
16. Steinemann, S.; Berg, B.; Skinner, A.; DiTulio, A.; Anzelon, K.; Terada, K.; Oliver, C.; Ho, H.C.; Speck, C. In situ, multidisciplinary, simulation-based teamwork training improves early trauma care. *J. Surg. Educ.* **2011**, *68*, 472–477. [[CrossRef](#)] [[PubMed](#)]
17. Knobel, A.; Overheu, D.; Gruessing, M.; Juergensen, I.; Struwer, J. Regular, in-situ, team-based training in trauma resuscitation with video debriefing enhances confidence and clinical efficiency. *BMC Med. Educ.* **2018**, *18*, 127. [[CrossRef](#)] [[PubMed](#)]
18. Kelleher, D.C.; Kovler, M.L.; Waterhouse, L.J.; Carter, E.A.; Burd, R.S. Factors affecting team size and task performance. *Pediatr. Emerg. Care* **2014**, *30*, 248–253. [[CrossRef](#)] [[PubMed](#)]
19. Auerbach, M.; Roney, L.; Aysseh, A.; Gawel, M.M.; Koziel, J.M.; Barre, K.R.; Caty, M.G.M.; Santucci, K. In situ pediatric trauma simulation. *Pediatr. Emerg. Care* **2014**, *30*, 884–891. [[CrossRef](#)] [[PubMed](#)]
20. Kelleher, D.C.; Carter, E.A.; Waterhouse, L.J.; Parsons, S.; Fritzeen, J.L.; Burd, R.S. Effect of a checklist on ATLS task performance. *Acad. Emerg. Med.* **2014**, *21*, 1129–1134. [[CrossRef](#)] [[PubMed](#)]
21. van Maarseveen, O.E.C.; Ham, W.H.W.; van de Ven, N.L.M.; Saris, T.F.F.; Leenen, L.P.H. Effects of the application of a checklist during trauma resuscitations on ATLS adherence, team performance, and patient-related outcomes: A systematic review. *Scand. J. Trauma Resusc. Emerg. Med.* **2019**, *46*, 65–72. [[CrossRef](#)] [[PubMed](#)]
22. Rosqvist, E.; Lauritsalo, S.; Harjola, V.P.; Rautava, P. Short in situ trauma team simulation training improves non-technical skills. *Scand. J. Surg.* **2019**, *108*, 339–347. [[CrossRef](#)] [[PubMed](#)]
23. Hamilton, N.A.; Kieninger, A.N.; Woodhouse, J.; Freeman, B.D.; Murray, D.; Klingensmith, M.E. Video review improves team function in simulated trauma. *J. Surg. Educ.* **2012**, *69*, 428–431. [[CrossRef](#)] [[PubMed](#)]
24. Knight, P.; MacGloin, H.; Lane, M.; Mitchell, M.; Woodworth, L.; Higgins, B.; Molloy, E.J. Mitigating latent threats identified through an embedded in situ simulation program and their comparison to patient safety incidents. *Front. Pediatr.* **2018**, *5*, 281. [[CrossRef](#)] [[PubMed](#)]
25. Orellana, D.; Busch-Vishniac, I.J.; West, J.E. Noise in the adult emergency department. *J. Acoust. Soc. Am.* **2007**, *121*, 1996–1999. [[CrossRef](#)] [[PubMed](#)]

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.