

**Increasing Nursing Confidence and Competence with Pediatric Trauma Patients in a Rural
Emergency Department: An Executive Summary**

Erika Greene

College of Nursing, East Carolina University

Doctor of Nursing Practice

Dr. Bradley Sherrod

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Executive Summary

Main Points

- Rural pediatric trauma care starts in community hospitals that do not have specific education platforms for this high acuity, low frequency skill.
- In-situ simulation is an evidence-based intervention that can be used to increase both nursing confidence and competence in pediatric resuscitations.
- Simulation education and the associated debrief led to increases in nursing confidence as evidenced by increases in C-Scale scores. This increase was sustained throughout the six-month project period.
- Team communication and basic resuscitation skills were shown to improve through increases in the average STAT compliance in timely completion of skills.
- The demonstrated success in increasing nursing confidence and competence could be replicated at other rural emergency departments or with other nursing teams that have limited exposure to pediatric trauma.

Background and Purpose

A Level I Pediatric Trauma Center in eastern North Carolina has a transfer-in rate that is 12% higher than the national benchmark. Due to the rural geographic area that is served by this center, many pediatric trauma patients are initially resuscitated at rural emergency departments (ED) within the healthcare system. One ED has seen an increase in patient volume of 300% in the past two years, from 2023 to 2025. Despite this increase there has not been a change in the orientation or training processes for these nurses, specifically regarding pediatric trauma. The lack of education can lead to low levels of nursing confidence or team competence during these resuscitations.

A quality improvement project was designed to increase the confidence and competence of bedside nurses at a rural emergency department by providing the team with in-situ simulation education. The Lean Six Sigma DMAIC process guided the development of the intervention for this project. The DMAIC process allows for definition of a problem, measurement, analysis, improvement and ultimately control of the process (Coughlin & Posencheg, 2023). The overall goal was to control pediatric trauma care and allow the nurses to feel comfortable in the level of care that they were providing.

Simulation education scenarios can be used to increase exposure, confidence, and competence of pediatric trauma care (Horne et al., 2023). The use of the in-situ framework will also allow for identification of missing resources or processes that could improve the care of the pediatric patient (Lee et al., 2021). This is due to the education being completed within the actual care spaces with the department's equipment.

Methodology

Over a 6-month time frame, from January to June 2026, monthly simulation education offerings were completed. These sessions were voluntary for the nursing team, and this was clarified prior to each scenario. The data collected was deidentified using a unique code number for each team member. Nursing confidence was measured using the confidence scale or C-Scale that was developed by Dr. Susan Grundy. Each participant completed a pre-simulation C-Scale, a post-simulation C-Scale and a Simulation Effectiveness Tool – Modified (SET-M). During the simulation the Simulation Team Assessment Tool (STAT) was completed by the simulation team to evaluate team competence. The data collected was entered into an Excel spreadsheet. This data included demographic data, such as years of experience, trauma certification, and job role, the C-Scale scores, the SET-M scores, and the STAT compliance scores. The data was analyzed

with Microsoft Excel using descriptive statistics, specifically the mean C-Scale change, percentage of completion of STAT skills, and mean demographic data. A paired *t*-test was used to compare pre- and post-simulation C-Scale scores to identify statistical significance.

Results

The first scenario was an all-terrain vehicle accident. There was an average change in C-Scale of 5.05 pre- and post-simulation. A two-tail *t*-test demonstrated a *p*-value of $<.001$ which was statistically significant. The mean pre-simulation C-Scale score was 12.15 with the mean post score being 17.2, as seen in Table 1. The STAT allowed for collection of baseline data during the first scenario. The average percentage of complete and timely basic skills correctly demonstrated during this scenario was 86.36%. The team communication was measured as well and found to be complete and timely an average 90.74% of the time.

Scenario-2 involved a pediatric patient in a motor vehicle accident. The average change in C-Scale was 3.92 points. Table 3 breaks the C-Scale change down by individual simulation session. A two-tailed *t*-test was found to have a *p*-value of .002, which was statistically significant. The mean pre-score was 16.36 and the mean post-score was 20.3. The STAT scoring revealed an increase in the average basic skills timeliness to 92.1% from 86.36% in the first scenario. Team communication also saw an increase in compliance with an average of 96%.

A chief complaint of penetrating firearm injury was utilized for third scenario. Table 4 displays the C-Scale scores broken down by each simulation session. There were 16 nurses that completed this scenario with an average change in C-Scale scores of 4.63. The *p*-value associated with this change was found to be $<.001$, which was statistically significant. The mean pre-score was 14.56 with a mean post-score of 19.18. The STAT scoring continued to improve

with an average basic skill timeliness of 98.35% and a team communication average score of 100%.

Table 1 - Scenario 1- All Terrain Vehicle Accident (N=20)

<i>Session Number</i>	<i>Pre C-Scale</i>	<i>Post C-Scale</i>	<i>Average Change</i>	<i>Average SET-M</i>
1 (N=9)	12.44	16.78	4.33	27.78
2 (N=4)	12.50	18.75	6.25	29.25
3 (N=4)	11.50	17.00	5.50	28.00
4 (N=3)	11.67	16.67	5.00	30.00
Grand Total	12.15	17.20	5.05	28.45

Note. Scenario 1 was facilitated during four simulation sessions in January and February 2026.

Table 2 - Scenario 2 – Motor Vehicle Collision (N=15)

<i>Session Number</i>	<i>Pre C-Scale</i>	<i>Post C-Scale</i>	<i>Average Change</i>	<i>Average SET-M</i>
1 (N=4)	16.67	16.67	0	24.33
2 (N=5)	18	22.2	4.2	29.8
3 (N=6)	14.83	20.5	5.67	29.67
Grand Total	16.36	20.29	3.93	28.57

Note. Scenario two was facilitated in March and April 2026 with three sessions per month.

Table 3 - Scenario 3 – Firearm Injury (N=16)

<i>Session Number</i>	<i>Pre C-Scale</i>	<i>Post C-Scale</i>	<i>Average Change</i>	<i>Average SET-M</i>
1 (N=9)	14.44	18.56	4.1	27.37
2 (N=4)	15	20	5	30
3 (N=3)	14.33	20	5.67	26.67
Grand Total	14.56	19.18	4.63	27.93

Note. Scenario three was facilitated during the months of May and June 2026.

Strengths and Limitations

This project demonstrated a positive and sustained impact of simulation education on nursing confidence and competence. Thirty-two nurses were able to complete at least one education scenario, with four completing all three scenarios. Scenarios two and three both demonstrated higher pre-simulation C-Scale scores showing the impact of consistent exposure to pediatric trauma resuscitation education. The average C-Scale change was found to be statistically significant for each of the three scenarios. Nursing competence was assessed through tracking the STAT results over the intervention period. The compliance scores trending upward throughout the six-month timeframe. The ability to improve team communication in a department that relies heavily on nurse travelers is also a strength of this project.

Limitations to this project were related to completing the education while nurses had clinical responsibilities. The participation in the simulations was dependent on the ability for the nurse to step away from their assignment to participate. This limited attention in some cases as well as the nurses were listening out for their patients while completing the scenario. A final limitation in the project was that participation was voluntary, although for the nurses that participated the outcome was positive.

Implications and Conclusions

The implementation of a simulation education platform was successful in increasing both nursing confidence and competence. The nursing teams were engaged and attentive throughout the simulation scenarios. Staff participated throughout the six-month intervention period, even asking what will happen when the project was completed. Many times, in the later sessions the nursing teams would recite information that was provided in earlier sessions. They proved that the information was being retained, that their confidence was sustaining, and that their ability to

care for a pediatric trauma patient was elevated. In-situ simulation education is a simple way to provide impactful education that can improve patient outcomes.

References

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