CE 2.0 ANCC Contact Hours

Core Team Members' Impact on Outcomes and Process Improvement in the Initial Resuscitation of Trauma Patients

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ABSTRACT

Genesis Trauma Center is an American College of Surgeons—The Committee on Trauma–verified Level III facility located in Southeastern Ohio. Process improvement and patient safety showed inconsistencies in trauma documentation and comfort level of the nursing staff. In February 2014, Genesis implemented a trauma nurse leader program to provide a core team of trauma nurses for the initial resuscitation. The overall goal of implementing a trauma nurse leader (TNL) program was to focus education on a core team, providing an increased level of skill of experience to oversee trauma patient care. The TNL program has shown promise in the pilot phase by decreasing emergency department length of stay and improving trauma documentation.

Key Words

Core team members, Process improvement, Trauma nurse leader, Trauma resuscitation

PURPOSE

All emergency department (ED) registered nurses (RNs) specialize in rapid assessment and treatment. Some RNs are leaders for critical cardiac, pediatric, or trauma patients and provide additional skills and value to the mix of nurses in EDs. Typical staffing models do not often account for these individual strengths of staff nurses. On the highest level of trauma activations, ED charge nurses often assign specific individuals to those patients on the basis of availability and do not always get to factor in experience, skill, comfort level, and education. In our institution (a Level III adult trauma center), the exposure of each ED nurse to high-risk situations, specifically critically injured trauma activations, had been sporadic and variable due to staffing models and frequency of trauma activations. Because of our geographic location, we are the only verified trauma center in our six-county region and so receive both pediatric and adult trauma patients. This resulted in decreased comfort levels of nurses in critical traumas. In the past, this required providing additional trauma education for all ED staff nurses. This was a challenging endeavor to program administrators, as current management was restrained by productivity demands and maintaining the department budget, while needing to provide additional trauma education to a large nursing staff.

After providing additional trauma education to all ED nurses for 3 years (since trauma program design and inception), nurses were surveyed to assess comfort level and self-perceived knowledge of trauma care. Despite increasing trauma education provided each year, only 83% of ED nurses felt that they had received adequate trauma training, leaving 17% with perceived additional educational needs (Table 1). At this point, only 53.3% of ED nurses felt confident while working as the primary RN in the trauma bay for activated patients. In addition, when interviewing ED RNs, it was apparent that although many ED nurses showed a strong desire to acquire specialized strengths in trauma nursing care, there were also many ED nurses who expressed a preference to provide only generalized care to non–trauma patients. After reviewing survey results and feedback from individuals, it was apparent that still additional education and support was needed. Historically, rolling out education to the entire ED required all 80 nurses to come in on their days off or to get coverage to leave the floor for educational programs. This was costly and timely and had been tried for the past few years, with survey results still showing a gap in perceived knowledge. After analyzing the options, trauma program administrators decided to move forward with the idea of creating a core group of nurses who would receive additional trauma education and would then be assigned to the highest level of trauma activations. This would focus education on a smaller number, limiting the impact on budget and staff time but would, in theory, still deliver education to those nurses involved in the highest level of trauma activations. This led to the formation of the trauma nurse leader (TNL) program.

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TABLE 1 Emergency Department Nursing Survey

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am confident being the primary nurse in the trauma bay.	0.0%	10.0%	36.7%	40.0%	13.3%
I have received adequate training to care for the trauma patient.	0.0%	0.0%	16.7%	63.3%	20.0%
I am confident in providing evidence-based care of the pediatric trauma patient.	0.0%	0.0%	3.3%	56.7%	40.0%

Before implementing such a process, Trauma Services reviewed the literature on core team members in the initial resuscitation of trauma patients. Literature was searched for articles containing "trauma nurse leader," "core team members," "trauma nurses," "core trauma team," and "trauma activation team." Literature revealed a small group of trauma centers using a core team of nurses in the ED (Seislove, 2006; Wurster, Coffey, Haley, & Covert, 2009). In fact, one of the trauma centers already using a core team of nurses was in our region and is where all of our pediatric trauma patients are referred to for tertiary pediatric trauma care. They were willing to collaborate and share many of their lessons learned from implementing this process at their facility and frequently participated in conference calls with our facility early in the process.

We decided to pilot a program using core team members to address the ongoing challenges of maintaining a high level of trauma knowledge for ED staff nurses, as well as increased repetition of critical trauma resuscitations for nurses involved with resuscitations, and improvements in documentation. The TNL program was started to focus education, concentrate repetition of participation, and improve protocol compliance specifically for trauma resuscitation.

METHODS

This was a pilot project with retrospective analysis of 1,016 patients over a 2-year period. Approval through the institutional review board was not required through our institution for this project as it was a process improvement pilot project. Originating from our trauma process improvement patient safety review process, the TNL program was developed in direct result of educational opportunities identified, as well as opportunities identified in disparities in staff comfort level. The application process was open to all full or part-time ED RNs with at least 1-year experience and current Trauma Nursing Core Course (TNCC) certification. Nurses with active disciplinary action were excluded. Applications were reviewed and emphasis was placed on a nurse's interest in trauma care for selection. Eight RNs were selected for the pilot group. The pilot group of TNLs represented 10% of the ED nursing staff. To evaluate outcomes from the pilot project, we used ED length of stay (LOS), Glasgow Coma Scale (GCS) score, time to initial computed tomographic scans, and time to focused assessment with sonography for trauma (FAST) examination completion. In addition, we reviewed charting in the trauma narrator in our electronic medical record for completeness.

PROCESS

Once the pilot group was selected, monthly meetings began. The meetings included representatives from trauma services, TNLs, ED charge nurses, ED management, and staff from multidisciplinary departments. Trauma centers are required to have a focus on process improvement patient safety, which provided direction for the education at TNL meetings. Education was done through presentation, case studies, journal reviews, and often-provided nursing continuing educational credits. The majority of the time, education was led by the trauma medical director or assistant trauma medical director. Other times, nursing management or TNLs volunteered to lead educational presentations and discussions. Case studies were presented with clinical and documentation-based objectives. Trauma nurse leaders were required to attend 80% of scheduled monthly meetings. Meetings were scheduled for the 2014 calendar year to provide advance notice of dates and times. Absences were excused for vacation, paid time off, family medical leave act, and work conflicts, but staff were encouraged to find coverage to allow for attendance at meetings as much as possible. Attendance for the TNL group during the pilot period was 89%. Trauma nurse leaders were paid nonproductive time for their attendance. This cost was considered nonimpactful to the overall budget, especially when compared with the potential cost of providing increased annual education for the entire ED staff.

Trauma Services prepared the agenda, arranged presenters, and selected trauma cases for review. The meetings included team building, trauma education, and process improvement projects. Projects included patient safety initiatives, process improvement projects, and system improvements. Members also identified barriers to the TNL program and were involved in brainstorming and implementing solutions. Trauma services, TNLs, ED management, and

ancillary staff collaborated to implement the identified plans and worked together to overcome barriers. With this framework, process improvement initiatives were led by the TNLs instead of management-led initiatives.

Patients requiring any category of trauma activation were assigned a TNL as the primary RN, when a TNL was on shift. The TNL was the nurse coordinator of the initial trauma resuscitation. The TNL was responsible for documentation, compliance with protocol orders, and monitoring patient response to treatment and interventions. However, this pilot project involved only 10% of the total ED nursing staff, so there were times when a TNL was not scheduled. If a TNL was not working, or was not available due to other patient care duties, then the ED coordinator would assign the activated trauma patient as he or she would have prior to the pilot program. The TNLs functioned in the role of a peer-to-peer resource to other ED staff and would frequently field questions or concerns from other staff members. This also included providing educational opportunities when gaps were identified, functioning as a clinical resource for trauma-related care questions, and review of documentation of activated trauma patients when a TNL was not available for the primary RN role. They functioned as the primary point person for the trauma surgeon and the ED physician for all questions and orders relating to the care of the injured patient.

As any change can point out flaws, especially a staffing change, this was not a perfect system. The pilot group, although spread across shifts (day, evening, nights, and weekends), did not provide 24/7 TNL coverage. More specifically, the total full-time equivalent (FTE) for all TNLs in the pilot was 7.2 FTE. This is compared with the total ED FTEs at the time, which was 86 FTE. This means that TNLs were available approximately 8.3% of total shifts available. Although the goal was to have a TNL as the primary RN in all traumas, any ED staff nurse could still function in the role. But once the pilot was started, the perception was that only TNLs could be the primary RN for activated trauma patients. The optimal scenario would be a TNL was on shift and available to be primary RN, but when that was not the case, the TNL was to be a resource or to check in with the primary RN after the case for documentation points and questions. After some time of the pilot project, concerns came to light from ED nurses that they were not as comfortable documenting in the trauma narrator because they were not frequently using it anymore. Although the trauma narrator can be used on any ED patient (not just activated patients) and was available in the practice electronic charting system, neither option was routinely used enough to provide continued comfort for those times when ED nurses filled in as the primary RN role.

When starting the TNL program, we wondered what the impact would be to ED staff nurses who did not apply for the TNL pilot program, or who were not selected through the application process. Before rolling out the applications, our trauma medical director sent a personal letter explaining the program to all ED nurses via their home addresses, and copies of the letter were sent to all staff nurses via e-mail. We wanted to ensure, to the best of our ability, that all nurses received the information and invitation to apply. Because the program was not about recruiting specific individuals, but more about a nurse's interest in trauma, we first had to ensure that all had the opportunity to apply. In addition, even before accepting applications, and then throughout the initial months of the pilot, this topic was the focus of most of our questions to the TNL program already up and running in our region and also where we felt the benefit of their support the most. Being able to talk with a trauma program that had rolled this out gave us the benefit of hearing many of the complaints, misperceptions, and challenges of a core team, even before we had started experiencing them ourselves.

Having that insight, we tried to work ahead and address some of the concerns even before we were hearing any concerns from the ED. Management of the ED was very supportive of the program and invited the trauma program to attend ED staff meetings to talk about the program as it was being rolled out and to address staff concerns. For the first few months, all seemed quiet—probably all were holding their breath to see what would happen. But eventually, a divide was noticed as we began to hear negative comments, such as "we are not good enough to be in traumas any longer," or "only the special nurses are allowed." Comments such as these were indicative of the climate and were the focus at many TNL program meetings to determine a course of action to help improve staff perception. The TNL meetings had always had a clinical education component and had a focus on process improvement but then shifted to also include leadership trainings, tips on relating to peers, as well as conflict management/resolution.

Is there a single moment in time when all have accepted a new process? Probably not—and it would be naïve to think all staff are in 100% support of the program even today. But the goal of the program was to provide staff who had more frequent trauma education and were more experienced in caring for the traumatically injured patient. It took close to 6 months to even begin to see a shift from negative to positive perceptions, but eventually, we were hearing more positive comments that indicated that TNLs were seen as a beneficial resource in the ED.

RESULTS

Reviewing electronic medical record charts from 2013 (prior to TNL implementation) showed 550 trauma activations. Trauma registry staff identified 96 charts with

incomplete documentation, resulting in 82.5% completion rate (Figure 1). These charts were then compared with the same time period (March through June) in 2014, revealing 465 trauma activations. Trauma registry staff identified 58 of these charts as having incomplete documentation, resulting in 87.5% completion rate (Figure 1). Leading mechanisms of injury were falls, motor vehicle crashes, and other vehicles (including all-terrain vehicles) in both data sets. Incomplete data points included time of trauma surgeon arrival, category of activation, initial GCS score, repeat GCS score, pupil size, respiratory rate, and breath sounds from both data groups. Post-TNL implementation, overall documentation incompletion rates decreased by 5%. This 5% improvement in completed charts allows for more accurate data abstraction, helping process improvement initiatives.

Glasgow Coma Scale score was one of the documentation points that the trauma program and the American College of Surgeons identified in April 2014 as an area of improvement, during a reverification visit. In 2013, there were 550 activated trauma patients, with 1,330 total GCS scores captured (Figure 2). Chart reviews of this time period revealed that of the 550 activated patients, some patients were not having any GCS scores documented, some were not having any repeat GCS scores documented, whereas other patients had more frequent GCS scores documented. Comparing these data with those of 2014 showed a significant increase in total numbers of GCS scores documented, with 465 activated trauma patients with 5,899 documented GCS scores (Figure 2).

The TNL pilot project was not the only initiative started with the goal to improve GCS score documentation. It should be mentioned that additional staff education was rolled out to the entire ED staff in March of 2014 in regard to GCS scores. After recognizing a need for increased GCS education, the ED educator included information about GCS in the weekly educational e-mails in May 2014. In addition, each ED nurse was given a laminated pocket card with the GCS scores and descriptions. Each of the

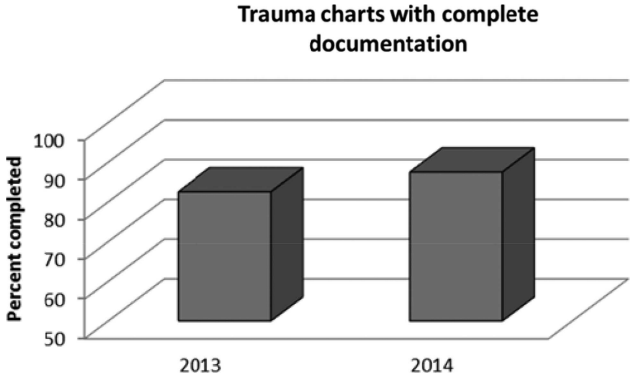

Figure 1. Documentation.

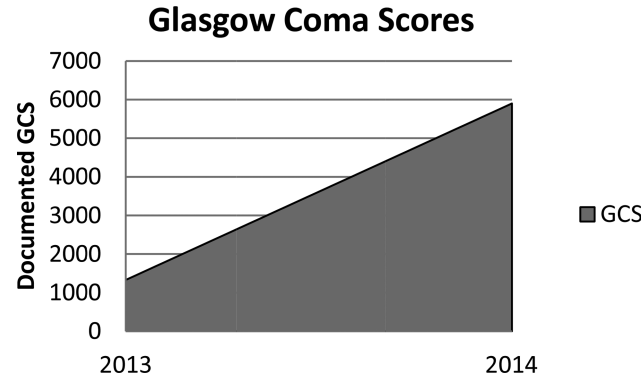

Figure 2. Documented GCS scores in activated trauma patients. GCS = Glasgow Coma Scale.

computers in the patient rooms had a GCS card attached to the side of it, providing a readily available resource in patient care areas. Additional locations for documenting GCS scores were added to triage vitals, as well as disposition vitals in the electronic medical record templates. Emergency department staff also had a group huddle twice daily, coinciding with major shift changes in which educational topics were presented. The importance of obtaining frequent GCS scores had been emphasized in the group huddle since May 2014. So, it is unclear whether the improvement in GCS score documentation was due to the additional education on GCS provided to all ED staff, or due to the TNL pilot, or a combination of the two initiatives that were both going on in the Spring of 2014.

For the TNL group, additional learning opportunities were provided in regard to GCS, including journal articles and lectures. When reviewing the improvement in GCS score documentation with the TNL group, overall staff knowledge and awareness had increased (as gathered by discussions and evaluations at TNL staff meetings). In addition, benefits from a medicolegal standpoint and compliance with national standards are now both improved with the detailed and frequent documentation of GCS.

Emergency department LOS is an important metric when evaluating throughput and patient care. Resuscitation in the ED should be the shortest LOS for the patient, allowing the patient to move to surgery, admission, or transfer for definitive care. Category 1 activations (highest level, most critical patients) for 2013 showed an average LOS of 106 min, whereas 2014 category 1 activations showed an average of 96-min LOS, showing a 10-min improvement in the ED LOS (Figure 3). Education provided at TNL meetings included rationale behind trauma protocol orders and additional education regarding Advanced Trauma Life Support (ATLS)/TNCC primary and secondary survey assessments. The TNLs acknowledged an increase in understanding of protocols, urgency in following protocols, and an increased sense of autonomy in redirecting trauma care. When working to identify where

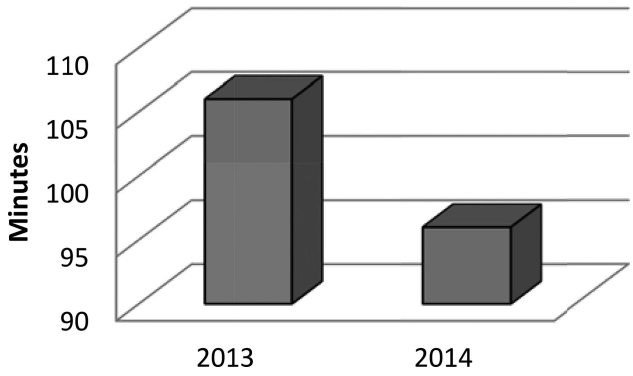

Figure 3. Emergency department length of stay.

the additional 10 min were gained (or lost, depending upon perspective), it was noted that Category 1 activations that go to the operating room showed the largest improvement, with a 37-min improvement in average times when comparing 2013 year-to-date data with 2014 year-to-date data. The second population of Category 1 activations showing a significant improvement in LOS were patients being transported to the critical care unit, with a 15-min improvement from 2013 (year to date) to 2014 (year to date). Reviewing these improvements with the TNL group revealed that they felt more knowledgeable regarding mechanisms of injury and suspected injury patterns. They also indicated an increased awareness of the importance of trauma protocol orders, placing protocol orders early in the resuscitation process, and increased comfort in speaking up while in the initial resuscitation to direct care.

Patient care processes were also evaluated to ensure that improved documentation compliance did not delay patient throughput and care. When educating staff to improve documentation, it was commonly remarked that if staff were to focus that much on documentation, patient care would not occur as quickly. Nurses in the trauma bay are responsible for preparing the ultrasound machine for FAST examinations and saving final images. Data showed maintenance of established throughput times as the average time to FAST completion was 18 min for 2013 and also 2014. The time to initial computed tomographic scanning for activated trauma patients was another data point evaluated. The ED RNs identified that documenting while traveling off the department for testing was already a challenge, so evaluating this data point was an area of focus. Data showed an average time of 32 min in both pre-TNL and post-TNL implementation. Both FAST examination completion time and initial computed tomographic scanning times showed that patient throughput had been maintained, despite the additional focus on improving documentation.

Emergency department management identified an additional benefit of the TNL program that had not been an original goal. The identified benefit was increasing educational opportunities and increasing staff knowledge, while maintaining the current department educational budget. With current health care trends, there is an increasing demand for a wide variety of education, especially in EDs. Being able to provide focused, trauma-related education to a smaller pilot group to attend live in-services and trainings allowed for high-quality education, thus limiting the overall cost. Although meeting minutes are posted and sent out via e-mail, this has not been a perfect system as we have occasionally stumbled upon information that was not completely disseminated. Improvements can and need to be made in ensuring that education and process improvements are clearly communicated with all.

CONCLUSION

Trauma centers today are challenged with providing high-quality patient care while maintaining budget constraints. Trauma patients are complex, requiring staff education on a wide variety of equipment, diagnoses, and procedures. Focused education in a core group of nurses, the TNLs, provided improved documentation compliance and decreased ED LOS, while maintaining ED throughput to testing and initial workup. Increased trauma education can be provided without increasing the ED department budget. Next steps for this pilot project would be additional program growth to include 24/7 TNL coverage in the ED, improved dissemination

KEY POINTS

- Core team members—When a trauma patient presents to the emergency department with critical injuries, a team must assemble to provide emergency care and stabilization for the patient. Emergency department nursing staff usually all rotates through this role, but individuals do not always provide the same level of expertise or experience. Core team members limit the total number of staff rotating through this position, providing an increased frequency of experience to each core team member.
- Focused education for limited staff members can improve outcomes—Focusing education on core team members (TNLs) impacted patient length of stay (LOS) in the ED and was able to impact LOS without increasing the overall department budget. In fact, there was a 10-min ED LOS improvement for Category 1 trauma activations.
- Improving documentation—It is important to recognize that ensuring documentation compliance in the electronic medical record did not delay care provided to patients. With a focus on education and documentation for the TNLs, there was a significant improvement in GCS documentation after TNL implementation. Computed tomographic scanning and FAST imaging times were maintained after TNL implementation.

of information and education to all staff, continued process improvement patient safety initiatives, and possible expansion of the concept of core team members to multidisciplinary departments.

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REFERENCES

Seislove, E. (2006). The "core" of resuscitation. *Journal of Trauma Nursing*, *13*(3), 136–139.

Wurster, L. A., Coffey, C., Haley, K., & Covert, J. (2009). The role of the trauma nurse leader in a Pediatric Trauma Center. *Journal of Trauma Nursing*, *16*(3), 160–165.