

Implementation of Post Event Debriefing in the Neuroscience Intensive Care Unit

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Abstract

Problem: The Neuroscience Intensive Care Unit (Neuro ICU) team frequently performs emergent resuscitation procedures. Debriefing is a form of learning in which everyone involved reflects on performance and plans on improvement. The Neuro ICU does not have a standardized procedure to debrief after patient resuscitation events.

Purpose: The purpose of this quality improvement (QI) project was to implement a structured debriefing program utilizing a debriefing tool for Neuro ICU team members after all medical resuscitation events, including emergency intubations, cardiac arrests, acute changes in patient neurologic status, and any other significant patient events.

Methods: The QI project was implemented in the Neuro ICU at an urban academic medical center. The project was implemented over a 14-week period. During the first 2 weeks, education about the process of debriefing and the debriefing tool occurred. Over the next 12 weeks the team implemented the project, which included tracking utilization of the tool after each event. The data were analyzed with descriptive statistics, such as percentage of debriefings completed each week.

Results: The Neuro ICU team completed 28 debriefings utilizing the debriefing tool. There was an 80% increase in debriefings, compared to 0% debriefings before the project.

Conclusions: Implementation of the new debriefing process has helped the Neuro ICU team to identify areas and strategies for improvement in patient care, promoted communication between team members, and enhanced their clinical knowledge. Utilization of the Critical Event Debriefing tool created a structure to the debriefing process. To promote sustainability of the project, continuous engagement and support from the project champions, as well as promotion and expansion of the project to other units of the hospital are considered as future strategies.

Introduction

Approximately 200,000 cardiac arrests occur each year in the United States when medically unstable patients are managed by a team of healthcare professionals (Wolfe et al., 2014). It is important that these teams provide optimal care during resuscitation procedures and demonstrate effective team work. However, many medical settings often fail to provide efficient and quality care during resuscitation procedures (Wolfe et al., 2014). This is due to high pressure, stressful, and chaotic environments in which medical personnel often operate. This might negatively impact patient outcomes by delaying the necessary treatments and required care in an emergency situation (Wolfe et al., 2014).

Debriefing is a form of learning in which everyone involved reflects on performance and plans on improvement (Tannenbaum & Cerasoli, 2013). The Neuro ICU medical staff in an urban academic medical center did not utilize a standardized procedure to debrief after patient resuscitation events. On average, there are 13 events occur on the Neuro ICU in one month and no debriefings were performed. This did not allow all of the medical staff who were involved in a resuscitation event to discuss and to examine team performance, self-reflect, or to recognize errors, which helps them to develop strategies to improve future performance, resulting in improvement in quality of patient care (Tannenbaum & Cerasoli, 2013).

The purpose of this quality improvement (QI) project was to implement a structured debriefing program utilizing a debriefing tool for the Neuro ICU members after all medical resuscitation events including emergency intubations, cardiac arrests, acute changes in a patient's neurologic status and any other significant patient events. An anticipated outcome of this QI project was that the Neuro ICU team members would perform 100% of structured debriefings utilizing the debriefing tool after all of medical resuscitation events, which would result in the

team demonstrating improved teamwork and improved quality of patient care during the events.

Literature Review

The need to implement a standardized debriefing program after resuscitation procedures was the focus of this evidence review. This review will begin broadly with evidence supporting the implementation of debriefings after patients' acute events. The discussion will be followed by a review of the evidence-based process of debriefing. Finally, the review will conclude with the discussion about benefits when healthcare personnel participate in a debriefing program.

The synthesis of outcomes of the research studies about debriefings after resuscitation events suggested that their implementation improves patients' outcomes and healthcare providers' clinical performance during a resuscitation process (Bhanji, 2015; Couper, 2013; Gillen, 2019). The studies reported that debriefing helps participants learn from events and further develop their clinical skills (Bhanji, 2015; Tannenbaum, 2013; Wolfe, 2014). Debriefing improves communication between team members during resuscitation events (Berg, 2014; Gillen, 2019). Wolfe et al. (2014) found that performing debriefing sessions after acute events was associated with the quality of resuscitations and the survival of patients with favorable neurologic outcomes.

Most of the studies concluded that guided reflection during debriefings promotes behavior change, increases participants' knowledge, and further develops clinical skills (Bhanji, 2015; Couper, 2013; Gillen, 2019). Debriefing sessions are most beneficial if they are structured and performed utilizing a debriefing tool, which results in standardized debriefings (Bhanji, 2015; Gillen, 2019; Mullan, 2012; Rose, 2018). The ideal time to perform a debriefing is shortly after finishing patient care delivery, and it is feasible to have a debriefing that last less than 10 minutes (Mullan, 2012; Rose, 2018). Debriefings can be successfully performed by nurses,

charge nurses and fellows who do not have any experience in performing debriefings (Rose & Chen, 2018).

Participating and sharing a feedback during a debriefing helps the medical staff understand all team members' roles (Berg, 2014; Gillen, 2019). With the implementation of debriefing, quality of communication and interdisciplinary interactions improve (Berg, 2014; Gillen, 2019). Structured debriefings increase the awareness of barriers to communication and its impact on patient safety (Gillen, 2019).

Most of the studies included in the evidence review were conducted in acute care settings such as trauma units, emergency departments and intensive care units. The studies found substantial evidence to support debriefing programs after patient resuscitation events. The literature varies in level and quality. The majority of the studies have good quality of evidence, but few of them are lower quality of evidence. There are limitations to the literature, including small sample sizes as well as limited number of sites for the studies (Table 1 and Table 2).

Most of the studies concluded that debriefing shortly after an acute event benefits patient and the medical team. All of the studies support debriefing as a structured process and report benefits from utilizing a standardized tool to facilitate the process. There are few differences, such as analysis of different facilitators of a debriefing process. For example, the study by Gillen et al., (2019) examined utilizing the fellow role, and the study by Rose and Chen (2018) examined the charge nurse role. However, the other author concluded that a person without any experience in debriefing process can perform debriefing successfully.

The evidence review supports implementation of a structures debriefing program utilizing a debriefing tool, after acute patient events to improve medical team performance, quality of patient care and patient outcomes.

Theoretical Framework

Lewin's Change Theory (LCT) was designed by Kurt Lewin to evaluate the process of change in an organization ("Lewin's Change Theory," n.d.). This model consists of three steps: unfreeze, change, and refreeze ("Lewin's Change Theory," n.d.). Unfreezing is the first step in creating change in an organization, in which movement away from status quo and recognition of the need for change is established by an organization ("Lewin's Change Theory," n.d.). During the change stage, the current practice is reviewed in order to move to a new and improved process. This can involve a change in a behavior, thoughts, and feelings of a group of people ("Lewin's Change Theory," n.d.). Refreeze stage involves making the created change a foundation for practice, which subsequently becomes a standard procedure that the organization follows ("Lewin's Change Theory," n.d.).

Implementation of debriefings after emergency events in the Neuro ICU was not a standard practice. LCT was used to leverage the practice change on the unit. First, in the unfreeze stage, the medical team on the unit was assessed for resistance to change and any driving forces to make the change possible. Second, during the change stage, debriefing was implemented. This process is not linear but open to trial and error, and modifications ("Lewin's Change Theory," n.d.). The last stage was making the change a new habit or standard of practice. After the implementation of the new process of debriefing, it was important to "refreeze" the changed behaviors of the medical staff of the Neuro ICU. During this stage the new process was locked into place. Recognition and praising the team members for following the process of debriefing helped to standardize the new practice change. For individuals who were still uncomfortable with the process, reeducation and accountability increased their compliance with debriefings.

Methods

The QI project was implemented in a 22 bed Neuro ICU at an urban academic medical center. The population included all of the nurses, attending physicians, nurse practitioners, pharmacists and physician fellows who work on the unit. These team members provide care to patients on a daily basis. The project focused on the implementation of a debriefing process utilizing a debriefing tool. A Critical Event Debriefing tool facilitated the process of debriefings (Appendix A). Debriefing events included emergency intubations, cardiac arrests, and acute changes in neurologic status, and other significant patient events. To protect human subjects, no patient identifiers were used during this project. The Institutional Review Board determined the project as nonhuman subjects research as it does not involve a clinical investigation designed to develop or contribute to generalizable knowledge.

On the first day of the project implementation phase, the project leader placed posters on the unit and provided small gifts for the Neuro ICU team to increase awareness of the project start date. The project leader placed manila envelopes named “Completed Debriefing Tools” in each nurse report rooms to collect completed debriefing tools. The project leader created a table poster to increase the medical staff compliance with the project process, and to provide information and instructions on the debriefing process (Figure 1).

The project started with 2 weeks of educational sessions for Neuro ICU team members. First, the project leader educated the project champions about the debriefing process and debriefing tool, which was tracked with a sign off sheet (Appendix B). Next, project champions assisted the project leader in the education of the entire unit medical team, which was tracked with another sign off sheet (Appendix C).

The team members who participated in the treatment and management of patients’ acute

events debriefed during the same working shift. Unit charge nurses facilitated debriefings in their respective report rooms and were responsible for completing the tool. The project leader collected the completed debriefing tools weekly from manila envelopes located in two nursing report rooms. The project leader stored the tools in a locked cabinet in the unit senior clinical nursing office. These debriefing tools tracked the process measures. To assure each event was tracked and recorded, the project leader communicated with charge nurses each shift.

The team leader utilized a “Debriefing sessions data collection sheet” to collect the data, which included data about the occurrence of debriefing after each event, type of critical event, participant roles, and comments about the team performance during each event (Appendix D). The team utilized this tool to track implementation progress and to assess the Neuro ICU staff compliance with the new process. The outcome measures were tracked with an assessment of frequency of debriefings after each event on the unit. Run charts completed weekly tracked the trends and variation over the time. The goal of the project was to perform debriefings after all patient acute events. The project leader calculated compliance by the number of debriefings performed compared to the number of total patient acute events that occurred. This data was expressed in the percentages.

The project leader communicated the findings to the entire Neuro ICU staff every 2-3 weeks with a short description about the progress via email. The project leader utilized the email communication to recognize the staff in their successful completion of debriefings and to encourage them to continue to debrief after each patient acute event.

Results

The changes in the Neuro ICU practice occurred with the project initiation and completion. The team started to perform debriefing on patient critical events. Charge nurses, bedside nurses, nurse

practitioners and physician fellows performed debriefings utilizing the debriefing tool. Nurses, charge nurses, respiratory therapists, nurse practitioners, physician fellows, attending physicians, patient care technicians and unit secretaries participated in the debriefings.

During the project implementation phase, a total of 35 patient events occurred. The Neuro ICU team performed debriefings on 28 events. These included cardiac arrest (n=1), emergent intubation (n=11), medication error (n=1), miscommunication related to a patient transfer (n=1), acute change in neurologic status (n=6), acute change in hemodynamics (n=2), patient fall (n=2), near miss fall (n=1), patient agitation (n=1) and patient possession/use of illegal substance (n=2). The team utilized the Critical Event Debriefing Tool to perform each debriefing. The team did not perform debriefings on 7 events. These included emergency intubations (n=4), near miss fall (n=1) and acute change in neurologic status (n=2).

The frequency of debriefings increased from 0% at the project implementation to 80% by the end of project completion. Utilization of the Critical Event Debriefing tool created a structure to the debriefing process and helped participants to remain focused during debriefings.

Barriers to the completion of the missed debriefings were high patient acuity and nursing staffing shortage during the COVID-19 pandemic. Project facilitators included the support from the project champions and the Neuro ICU leadership group reinforcing the debriefing process.

Discussion

This QI project aimed to implement a structured debriefing process in the Neuro ICU. After the project leader educated project champions about the debriefing process, they contributed to the project success. Their continuous support and encouragement of the Neuro ICU staff to perform debriefings increased the number of completed debriefings from 0% to 80%.

The team utilized a structured debriefing approach and the debriefing tool. Having a structure and a tool for the debriefing process supports the findings from research studies, which concluded that guided reflection during debriefings promotes communication between team members, increases participants' knowledge, and further develops clinical skills (Bhanji, 2015; Couper, 2013; Gillen, 2019).

During the debriefings the team identified areas of suboptimal team performance and strategies for improvement to provide better quality of patient care. Debriefings created awareness of barriers in patient care during critical events. This helped the Neuro ICU team to initiate strategies to improve and provide efficient and effective patient care. These findings were consistent with Berg et al. (2014) and Bhanji et al. (2015) results that debriefings created awareness of barriers of the medical team communication and errors, which promoted change in team's behavior.

The team performed each debriefing in less than 10 minutes during the same working shift. These results were consistent with Mullan et al. (2012) and Rose et al. (2018) findings that it is feasible and ideal to perform debriefings shortly after the event, and it is feasible to have a debriefing that lasts less than 10 minutes.

Charge nurses, bedside nurses, nurse practitioners and physician fellows performed debriefings. The results were consistent with Rose et al. (2018) and Gillen et al. (2019) findings that debriefings can be successfully performed by nurses, charge nurses and fellows who do not have any prior experience in performing debriefings.

Limitations to the generalizability of the QI project include its implementation on the unit specialized in neurology and neurosurgical patient care. The debriefed events were limited to specific events for the unit. There are intensive care units which may have more frequent cardiac

arrest events and less frequent acute change in neurological status events.

The project was designed to perform debriefings after critical events and included “any other significant patient event” as the event to be debriefed. This could create confusion among the team members about which event to debrief. Identifying particular events to perform debriefings on may help in increasing the compliance with the debriefing process. However, it is important to state that the Neuro ICU team was enthusiastic to debrief on various types of events in order to improve quality of patient care. Thus, other units may evaluate the events that occur on their units and include them in the debriefing sessions.

Conclusion

The QI project introduced a new process of debriefing utilizing the debriefing tool in the Neuro ICU. The team manages patient emergencies frequently. Thus, the new debriefing process was relevant for the ICU because it helped the team to discuss their performance during the occurred events, and to decide on solutions to improve patient care.

The project results demonstrated that it is feasible and useful to debrief after each patient critical event. This helped the team to recognize errors, discuss strategies for improvement and increase clinical knowledge, which improved quality of patient care in the ICU. The project results demonstrated that it is beneficial to debrief shortly after the event to ensure the recollection of the event and the presence of team members involved in the event. The strengths of this new process of debriefings were that debriefings were performed shortly after events, it took short period of time to complete the debriefing sessions, and utilization of the debriefing tool provided structure to debriefing sessions.

To ensure sustainability, project champions and leadership of the unit are accountable to continue to reinforce the debriefing process daily during the shifts and staff meetings. Project

champions introduce the debriefing tool and educate new unit staff about the debriefing process. The tool was added to Neuro ICU intranet resources and is available in printed form in the charge nurse's resource book. Project champions are held accountable for continuous support and education of the Neuro ICU team members. These strategies maintain and reinforce sustainability of debriefings as a standard patient care process. Future implications for practice include facilitating and collaborating with other ICUs to expand debriefing process.

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Table 1.
Evidence Review Table

Citation: Berg, G. M., Hervey, A. M., Basham-Saif, A., Parsons, D., Acuna, D. L., & Lippoldt, D. (2014). Acceptability and implementation of debriefings after trauma resuscitation. <i>Journal of Trauma Nursing</i> , 21(5),201-208. http://eds.a.ebscohost.com.proxy-hs.researchport.umd.edu/eds/pdfviewer/pdfviewer?vid=3&sid=ce062ca0-13d0-4483-b060-f6b5ef492313%40sdc-v-sessmgr02					Level
					VI C
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
“The purpose of this study was to assess team members’ acceptability of the proposed change after a 3-month trial period as well as to compare trauma team members’ pre-/post perceptions regarding their role on the trauma team.”	Pre and post intervention design survey study	<p>Sampling Technique: All trauma resuscitation team members were invited to participate</p> <p>Subjects: Attending/staff physicians, nurses, mid-level practitioners, technicians, pharmacists.</p> <p># Eligible 95 trauma team members</p> <p># Accepted: 58 trauma team members</p> <p>Power analysis: Statistical significance was set at $P < .05$.</p> <p>Group Homogeneity -Most survey respondents were female (62%), with a mean age of 39 years (standard deviation, 12.25 years). Respondents (post survey) identified their current role in the hospital as attending/staff physician (9%), nursing</p>	<p>Intervention: -Surveys were administered before and after a 3-month trial implementation of the structured debriefings. - Survey questions were Likert in nature (scale: 1 = strongly disagree; 5 = strongly agree; and 1 = never; 5 = always). - Structured debriefings were conducted for 3 months after initial implementation.</p> <p>Intervention fidelity The assigned debriefing leader followed a designated script, recorded leader name (for follow-up information, if necessary), and noted issues during the debriefing -The same pre and post survey was administered to participants.</p>	<p>Dependent variable: Acceptability of debriefings and self-perceptions after multidisciplinary trauma resuscitations.</p> <p>Measurement tool -Survey questions adapted from the AHRQ hospital patient safety questionnaire (AHRQ survey). -Survey questions were Likert in nature.</p>	<p>Statistical Procedures(s): Pearson chi-square analysis was conducted to evaluate all of tire categorical responses between pre- and post-surveys. Data analysis was conducted using SPSS version 20.0</p> <p>Results: -Respondents were more agreeable in understanding their role (2% improvement), perspectives of team members’ respect (14% improvement), support (9% improvement), safety to give opinion (11% improvement), get feedback (16% improvement), reporting problems to the group (9% improvement), and to immediate supervisor (6% improvement).</p>

		<p>(24%), mid-level practitioner (10%), technician (9%), pharmacist (22%), and other (26%).</p>			<p>- Improvements were observed in unit teamwork (17%), workload (10%), and hours (10%) related to patient safety -Respondents were more agreeable in patient safety improvements (9% improvement), the evaluation of their effectiveness (18% improvement), improvements in communication concerning patient care (14%), errors in the unit (5%), prevention of errors (12%), and feedback (10%) - respondents agreed the structured debriefings provided an opportunity for the team to identify and resolve problems and ambiguities (82%) in a no-blame, nonjudgmental atmosphere (82%). -The structured debriefings increased the awareness of barriers to communication (67%) and how communication can</p>
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					<p>impact patient safety (82%). -Respondents agreed the structured debriefings are worthwhile (76%), strengthen the trauma team (82%), and should be continued within the trauma center (71%).</p>
<p>Citation: Bhanji, F., Donoghue, A. J., Wolff, M. S., Flores, G. E., Halamek, L. P., Berman, J. M., Sinz, E. H., & Cheng, A. (2015). 2015 American Heart Association guidelines update for cardiopulmonary resuscitation and emergency cardiovascular care, <i>Circulation</i>, 132(suppl 2) :S561–S573. https://www.ahajournals.org/doi/pdf/10.1161/CIR.0000000000000268</p>					<p>Level II B</p>
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
Evidence-Based practice guidelines	Guidelines based on systematic reviews and meta-analysis studies; prospective, randomized, controlled study, multicenter randomized trial	N/A	<ul style="list-style-type: none"> - AHA collaborated with resuscitation councils throughout the world, via the International Liaison Committee on Resuscitation (ILCOR), to evaluate resuscitation science -Online evidence review process, the Scientific Evidence Evaluation and Review System (SEERS), to support ILCOR systematic reviews. -Grading of Recommendations Assessment, Development, and Evaluation (GRADE) software. 	N/A	<p>Guidelines suggest:</p> <ul style="list-style-type: none"> -Debriefing supports participants’ development toward mastery of skills. -An essential component of resuscitation education is the experiential learning that occurs through simulation and the associated debriefing. -Simulated scenarios important part of resuscitation education with completion of debriefings. -Constructive debriefings maximize knowledge, allows for guided reflection that promote change in performance.

					-AHA promotes the use of structured and supported debriefing by using the GAS (gather-analyze-summarize) model of debriefing paired with evidence-based scripted debriefing tools.
Citation: Couper, K., Salman, B., Soar, J., Finn, J., & Perkins, G. D. (2013). Debriefing to improve outcomes from critical illness: a systematic review and meta-analysis. <i>Intensive Critical Care Medicine</i> , 39, 1513-1523. doi10.1007/s00134-013-2951-7. https://link-springer-com.proxy-hs.researchport.umd.edu/content/pdf/10.1007/s00134-013-2951-7.pdf					Level V A
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
“Intensive care clinicians play a central role in the coordination and treatment of patients that develop life-threatening emergencies. This review evaluates the effect of debriefing after life-threatening emergencies and considers the implications for intensive care training and practice.”	Systematic review and meta-analysis	Sampling Technique: Cochrane, MEDLINE, EMBASE, CINAHL, ERIC and PsycINFO databases were searched for studies related to debriefing after life-threatening emergencies # Eligible: 2,720 studies # Accepted: 27 studies Most studies were clinical studies (n = 19) with the remainder being simulation studies (n = 8). Power analysis: Searched studies required at least one statistically significant (p< 0.05) result to be considered as supporting or opposing the use of debriefing. Group Homogeneity:	Outcome stratification: Studies were grouped together based on Kirkpatrick’s four level system for evaluation of educational interventions: reaction, learning, behavior, results. Quality assessment: Assessment of risk of bias by two authors, GRADE evaluation system for quality of evidence, inclusion of at least one statistically significant result. Data extraction: Data reviewer extracted the data, data assistant checked for accuracy with the help of a data extraction tool.	Dependent variable: Improvement of clinicians’ knowledge and skill acquisition. Measure: Studies were grouped in four levels: clinician reaction/feedback to debriefing (level I: reaction), effect on clinician learning (level II: learning), effect on clinical process variables (level III: behavior), and patient-focused outcomes (level IV: results). Level III behavior outcomes were sub-categorized as technical performance (e.g. chest compression depth) and nontechnical performance (e.g. teamwork).	Statistical Results: 20 studies supported the use of debriefing. Debriefing was viewed positively (n = 3), improved learning (n = 1), enhanced non technical performance (n = 4) and technical performance (n = 16), and improved patient outcomes (n = 2). -Four cardiac arrest studies presented evidence of improved resuscitation process outcomes [compression fraction (mean difference 6.80, 95 % CI 4.19–9.40, p<0.001)] and short-term patient outcome [return of spontaneous circulation (OR 1.46, 95 % CI 1.01–2.13, p = 0.05)].

		Heterogenous sample: RCTs, case studies, pre/post design studies, survey, non-RCTs. Heterogenous debriefing interventions.	Meta-analysis of a small group of cardiac arrest studies.		The study supports the use of structured debriefing as an educational strategy to improve clinician knowledge and skill acquisition and implementation of those skills in practice.
Citation: Gillen, J., Koncicki, M. L., Hough, R. F., Palumbo, K., Choudhury, T., Daube, A., Patel, A., Chirico, A., Lin, C., Yalamanchi, S., Pate-Aponte, L., & Sen, A. (2019). The impact of a fellow-driven debriefing program after pediatric cardiac arrests. <i>BMC Medical Education</i> , 19, 272. https://bmcmmededuc.biomedcentral.com/articles/10.1186/s12909-019-1711-y					Level VI C
Purpose/ Hypothesis	Design	Sample	Intervention	Outcome	Results
“Debriefing tool was developed as a tool for fellow development, as well as to enhance communication amongst a multidisciplinary team.”	Pre and post intervention design survey study	Sampling Technique: -The intervention took place at an urban, quaternary care hospital with a 41 bed PICU, caring for all critically-ill pediatric medical, surgical and cardiac patients (excluding those in the neonatal intensive care unit). -Debriefing was expected after every arrest. Subjects/ Eligible: all resuscitation team members were invited to participate in debriefings (i.e. fellows, attendings, nurses, residents, nurse practitioners, hospitalists, respiratory therapists, social	Intervention: - Creation and implementation of two tools to standardize debriefing: Data Sheet and a Debriefing Tool. -The fellows were introduced to the Data Sheet and Debriefing Tool during fellow orientation. -The fellows attended a yearly faculty-led debriefing workshop to refresh debriefing skills. Intervention fidelity -Through a series of Plan-Do-Study-Act (PDSA) cycles, the Data Sheet and Debriefing Tool were created and revised. - Faculty provided monthly feedback to the	Dependent variable: Improvement in teamwork and medical management of life-threatening events. Measurement tool -Likert scale -Pre and post survey collection of the data.	Statistical analysis: Descriptive statistics were used to analyze the quantitative data from arrest sheets; Categorical questionnaire responses were analyzed using 2-tailed Fisher’s exact tests. Results: Post-intervention, the rate of debriefing after cardiac arrest was 84%, debriefing rates increased from 75% over the first 10 months to 94% over the final 9 months. Over half (52%) of the providers in the preintervention survey group reported experience with “more than 10” resuscitations

		<p>workers, consultants, administrators, etc.). # Accepted: 27 months study, 105 cardiac arrests were documented; 75 arrest Data Sheets and 63 formal debriefings using the Debriefing Tool. Power analysis: A p value of < 0.05 was considered significant.</p>	<p>PICU fellows regarding their compliance with debriefing and use of the Debriefing Tool.</p>		<p>in our PICU versus 43% of the postintervention survey group (p = 0.18). -Perceived debriefings occurring at least frequently increased from 9 to 58%, pre- and post-intervention respectively (p < 0.0001). -Post-intervention, 62% of providers agreed that the overall quality of communication during arrests had improved, and 58% agreed that interdisciplinary team interactions had improved. -Post-intervention, 61% of providers agreed that they were now more likely to request a debriefing after cardiac arrest. The study demonstrated that given the proper support (a curriculum and scripted debriefing tool), clinicians other than attending physicians can be trained as effective debriefing leaders.</p>
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Citation: Mullan, P.C., Wuestner, E. Kerr, T. D., Christopher, D. P., & Patel, B. (2012). Implementation of an in situ qualitative debriefing tool for resuscitations. <i>Resuscitation</i> , 84, 946–951. https://www.resuscitationjournal.com/article/S0300-9572(12)00940-9/fulltext					Level IV B
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
<p>“Our primary hypothesis was that a higher proportion of debriefings would occur for those resuscitated patients who required CPR than in those who did not require CPR. Additionally, we sought to describe the debriefing content, timing, predictors, patient outcomes, and patient characteristics. To our knowledge, no qualitative debriefing tools for the ED population have been published.”</p>	Retrospective observational cohort study	<p>Sampling Technique: A single pediatric ED, tertiary care center Subjects: all team members whose patients were resuscitated in the pediatric ED from May 9, 2011 to May 8, 2012. # Eligible -241 resuscitation of any patient who required CPR, intubation, or defibrillation in the ED. -included debriefings on patient who required CPR, intubation, or defibrillation. -Any debriefings that did not meet inclusion criteria were excluded. -Inclusion of all eligible resuscitation and measure adherence to DISCERN form completion.</p>	<p>Intervention: - DISCERN tool to create a standardized debriefing form that is simple to use for clinical staff with varied debriefing experience. Intervention fidelity: To assure face and construct validity, the researchers followed debriefing best practice guidelines while creating a DISCERN tool. - The TEAM rating guidelines were used to assure face validity to minimize variation. - The tool was pilot tested by study investigators for 2 months; minor modifications were made. - Physicians were trained on using the DISCERN form at two consecutive staff meetings. All nurses were trained in a 20-min presentation at baseline</p>	<p>Dependent variable: Improvements in clinical performance of the medical team after debriefings using the DISCERN tool. Measure: - Collected DISCERN forms were mapped to a list of all ED resuscitations. -DISCERN form comments were categorized by a framework approach into eight elements as described in the Team Emergency Assessment Measure (TEAM), a validated measurement tool designed for medical resuscitations.</p>	<p>Statistical Procedures(s): - Central tendency measures and two-sample tests of proportion were performed on all debriefing predictors. -Ages were compared by the non-parametric Mann–Whitney U test. -Thematic content from Results: -Total of 241 resuscitations with 63 (26%) debriefing documented. -DISCERN forms were completed by the primary nurse and team members in 191 (79%) resuscitations. -Significantly higher proportion of debriefings ($p<0.01$) occurred in patients who required CPR, defibrillation., intubation, patient outcome was death. -179 DISCERN forms completed had correct intervention designation 98.8% of the time with a kappa for intubations,</p>

			<p>and six months after implementation.</p> <ul style="list-style-type: none"> - A data entry expert (non-study investigator) reviewed every database entry. -two study investigators comprehensively reviewed every chart and recorded all interventions in a separate database. -A Cohen's kappa statistic was used to evaluate inter-rater reliability between the primary nurse and the study investigators. 		<p>defibrillations, and CPR of 0.85, 0.74, and 0.96.</p> <ul style="list-style-type: none"> -the study found that there is a higher likelihood of debriefings for patients who needed more intensive interventions, such as CPR. -the tool was found to be accessible and easy to utilize, seen in 88% of study's sample. -the timing of debriefings suggested that the team preferred to conduct it shortly after finishing patient care delivery. - 64% of debriefings lasted <10min, which shows feasibility of using DISCERN format in a busy medical setting. -comments from the DISCERN tool were found useful to guide QI efforts and future teamwork training program.
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Citation: Rose, S., & Chen, A. (2018). Charge nurse facilitated clinical debriefing in the emergency department. <i>Canadian Journal of Emergency Medicine</i> , 20(5), 781-785. https://www.cambridge.org/core/journals/canadian-journal-of-emergency-medicine/article/charge-nurse-facilitated-clinical-debriefing-in-the-emergency-department/CC224433937ACBA849491A66EBC9593D					Level VII C
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
“The purpose of this project was to develop a feasible and sustainable charge–nurse-facilitated clinical debriefing program.”	Educational report on a project of a charge-nurse-facilitated clinical debriefing program	Sampling Technique: -Three adult emergency departments -Charge nurses	Intervention: -A clinical debriefing intervention called INFO (immediate, not for personal assessment, fast facilitated feedback, and opportunity to ask questions) Intervention fidelity: debriefing tool was developed to specifically support the novice debriefer. American Heart Association guidelines provided examples of several debriefing tools for the development of the tool. -inter-professional engagement and support - “Teach the Teacher” workshop - INFO Basics workshop focused on the INFO tool and provided feedback on the charge nurses’ performances in simulated INFO debriefings.	Dependent variable: feasible and sustainable charge–nurse-facilitated clinical debriefing program	Results: -254 inter-professional ED INFO clinical debriefing sessions have taken place from March 2016 to September 2017. -Charge–nurse-facilitated debriefing is feasible, can be successfully implemented, and can be performed by relatively inexperienced debriefers. -A structured approach resulted in regular debriefings; - Debriefings became a routine part of improving team management of high stakes or unexpected clinical events. -Debriefings sessions had a 10 min median duration, involved over 1,300 staff.

Citation: Tannenbaum, S. I., & Cerasoli, C. P. (2013). Do team and individual debriefs enhance performance? A meta-analysis. <i>Human Factors</i> , 55(1), 231-245. https://journals-sagepub-com.proxy_hs.researchport.umd.edu/doi/pdf/10.1177/0018720812448394					Level V A
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
“Hypothesis 1: Individuals and teams that use debriefing are more effective than individuals and teams that do not use debriefing.” “Hypothesis 2: Debriefs are more effective when levels are aligned.” “Hypothesis 3: Facilitated debriefs are more effective than non-facilitated debriefs.” “Hypothesis 4: A higher level of structure is associated with a more effective debrief.” “Hypothesis 5: Debriefs using multimedia aids are more effective than debriefs not using multimedia aids.”	Meta-analysis	Sampling Technique: -Databases were searched included: PsycINFO, Scopus, PubMed, ERIC, Military & Government Collection, Business Source, and MEDLINE, databases from EBSCO - Databases were searched for literature containing variants of the words debrief or after-action review coupled with performance, effectiveness, ratings, and similar terms. # Eligible 1,561 unique, nonduplicated references. # Accepted: 111 effect sizes from 46 independent samples in 31 studies (29 published, 2 unpublished). Group Homogeneity: Heterogenous sample of studies from multiple databases.	Method: Quantitative meta-analysis across a diverse body of published and unpublished research on team- and individual-level debriefs. Intervention fidelity: Presence of additional variance is estimated through chi-square significance tests, which for a number of reasons can lead to inflated Type I or Type II error rates. -A sample contributed only once to any meta-analytic estimate to meet assumptions of independence.	Dependent variable: Effectiveness of team debriefings. Measurement tool - random-effects meta-analytic methods to aggregate effect sizes from primary data up to per population level.	Statistical Procedures(s): -Reported statistics (t values, F tests, means and standard deviations) converted to Cohen’s d, a standardized estimate of the difference between debrief and control conditions in standard deviation units. Results: - Findings from 46 samples (N = 2,136) indicate that on average, debriefs improve effectiveness over a control group by approximately 25% (d = .67). -Organizations can improve individual and team performance by approximately 20% to 25% by using properly conducted debriefs.

Citation: Wolfe, H., Zebuhr, C., Topjian, A. A., Nishisaki, A., Niles, D. E., Meaney, P. A., Boyle, L., Giordano, R. T., Davis, D., Priestley, M., Apkon, M., Berg, A., Nadkarni, V. M., & Sutton, R. M. (2014). Interdisciplinary ICU cardiac arrest debriefings improves survival outcomes. <i>Critical Care Medicine</i> , 42(7), 1688-1695. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4092119/pdf/nihms591467.pdf					Level VI B
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
“We hypothesized that our intervention (post arrest quantitative debriefing program), by improving the resuscitative care provided by the entire interdisciplinary team, would improve cardiac arrest survival outcome.”	Single-center prospective quality improvement interventional study using historical control	<p>Sampling Technique: A tertiary center facility with 516 inpatient beds. # Eligible: all chest compressions events in ICU # Accepted: 119 chest compression events # Control: 60 control chest compression events # Intervention: 59 chest compression events Power analysis: 17% baseline rate of survival to hospital discharge, absolute improvement of survival to 37% with implementation of debriefing to achieve 80% power. Group Homogeneity: Intervention/Control homogenous group of pediatric patients based on p values.</p>	<p>Control: Reviews of resuscitation care practices before the initiation of debriefings. Intervention: Structured team debriefings within 3 weeks of a chest compression event. Intervention fidelity: Intensive review of cardiac arrest documentation, identical monitors were used in both groups. Quantitative resuscitation data was used during debriefings, supporting literature with studies demonstrating improved patients’ outcomes.</p>	<p>Dependent variable: Improvements in patient survival with favorable neurologic outcomes.</p> <p>Measurement tool The dependent variable was measured with the help of software to extract quantitative CPR quality data. The measured variable included: chest compressions rate/min, depth, fraction, percentage with significant leaning. Time frame was 18 months.</p>	<p>Statistical Procedures(s): Widows-based software, statistical analysis with Stata Results: The intervention was associated with improved survival on univariate analysis (52% vs 33%, p=0.054) and after controlling confounders (adjusted odds ratio, 2.5; 95% CI, 0.91-6.8; p=0.075). Debriefings after resuscitation associated with 5.6 times likelihood of meeting targets of cardiopulmonary resuscitation (95%CI, 2.9-10.6; p<0.01).</p>

Table 2.
Synthesis Table

Evidence Based Practice Question (PICO): On Neurocare ICU, does implementing debriefings with the help of a debriefing tool by nurses after emergency medical events compare to no debriefings, will create a structured debriefing process and improve team performance during the events?			
Level of Evidence	# of Studies	Summary of Findings	Overall Quality
II	1	<p>Debriefing helps participants to learn from an event and further develop their clinical skills.</p> <p>The debriefings are needed to be constructive to maximize acquisition of knowledge.</p> <p>Guided reflection during debriefings promotes change and increases participants' knowledge.</p> <p>Debriefings should be structured and guided by scripted debriefing tools.</p>	<p>B- Bhanji, F. et al. (2015). Evidence-based practice guidelines based on a heterogeneous sample of studies. The guideline provides recommendations on resuscitations activities during and after an event. It provides evidence-based recommendations on best debriefing practices. The guideline mostly provides recommendations for debriefing practices for simulated learning environment, but states that these practices can be used for real clinical events as well.</p>
IV	1	<p>There is a higher likelihood of debriefings for patients who needed more intensive interventions.</p> <p>DISCERN tool is accessible and easy to utilize.</p> <p>It is ideal to conduct debriefings with the help of the tool shortly after finishing patient care delivery.</p> <p>Debriefings lasted <10min, which shows feasibility of using DISCERN format.</p> <p>-Comments from the DISCERN tool were found useful to guide QI efforts and future teamwork training program.</p>	<p>B-Mullan, P.C et al. (2012). The study used a sufficient sample and showed consistent results. It showed a fairly definitive conclusion. The intervention of the study was created following evidence-based practices. The recommendations from the study are used to guide QI projects and clinical studies. A limitation of the study is that it used a single site for the intervention.</p>
V	2	<p>Tannenbaum, S. I. et al. (2013). Organizations can improve individual and team performance by approximately 20% to 25% by using properly conducted debriefs. Structured debriefings are a valuable educational strategy to improve knowledge and skill acquisition.</p> <p>Couper, K. et al. (2013). Post resuscitation debriefings enhance clinical performance, enhance learning and improve patient outcomes. Post event debriefings improve resuscitation process.</p>	<p>A- Tannenbaum, S. I. et al. (2013) and Couper, K. et al. (2013). Both studies: High-quality and reliable studies. Systematically collected and appraised literature. Have clearly stated objectives and pre-defined eligibility for studies, have explicit and reproducible methodology. Assessment of validity of individual studies' results were evaluated for the risk of bias. Have systematic presentation and synthesis of the characteristics and findings of the included studies. Both studies showed definitive conclusion.</p>

<p style="text-align: center;">VI</p>	<p style="text-align: center;">3</p>	<p>Wolfe, H et al. (2014). Implementation of a post events debriefing program is scientifically associated with the quality of resuscitations and survival of patients with favorable neurologic outcomes. It is associated with increased likelihood of meeting the targets of cardiopulmonary resuscitation.</p> <p>Berg, G. M et al. (2014). By participating in debriefings, the improvements were seen in the team members feel support and safety to give opinion, get feedback, reporting problems to the group. It helps the participants in understanding themselves and team members roles.</p> <p>With the implementation of debriefings, quality of communication and interdisciplinary interactions improve</p> <p>Gillen, J et al. (2019). Debriefings help the participants in understanding themselves and team members roles. Facilitators without significant debriefing experience can successfully perform debriefings with the help of a script and a debriefing tool. It helps the participants in understanding themselves and team members roles.</p> <p>Structured debriefings increase the awareness of barriers to communication and how communication can impact patient safety.</p>	<p>B- Wolfe, H et al. (2014) The study had some control and reasonably consistent results. Overall sufficient sample and fairly definitive results. The results of the study have a valuable significance for clinical practice. A limitation of this study is the study design because time trends on the outcome of interest may not be fully accounted for in studies with historical controls.</p> <p>C- Berg, G. M et al. (2014). The study had a reasonably consistent result. It had a small sample size, done in a single setting, and had a short trial duration. There were some inconsistencies in the sample of participants and the intervention.</p> <p>C- Gillen, J et al. (2019). The study was performed in a single setting with a small sample size. The advantage of this study is that it was completed over long period of time. The study provides fairly consistent results and offers recommendations for clinical practice. The limitation of the study is in the sample being voluntary and inconsistent.</p>
<p style="text-align: center;">VII</p>	<p style="text-align: center;">1</p>	<p>Charge–nurse-facilitated debriefing is feasible, can be successfully implemented.</p> <p>Debriefings can be performed by relatively inexperienced participants.</p> <p>A structured approach results in regular debriefings.</p> <p>Debriefing sessions lasted around 10 minutes, which shows their feasibility.</p>	<p>C- Rose, S. & Chen, A. (2018). The study had fairly large sample size and consistent results. The study provides suggestions for changes to clinical practice. Moderate quality of evidence based on the type of study. No randomization and no control were utilized and no power analysis was reported to contextualize the adequacy of the sample size.</p>

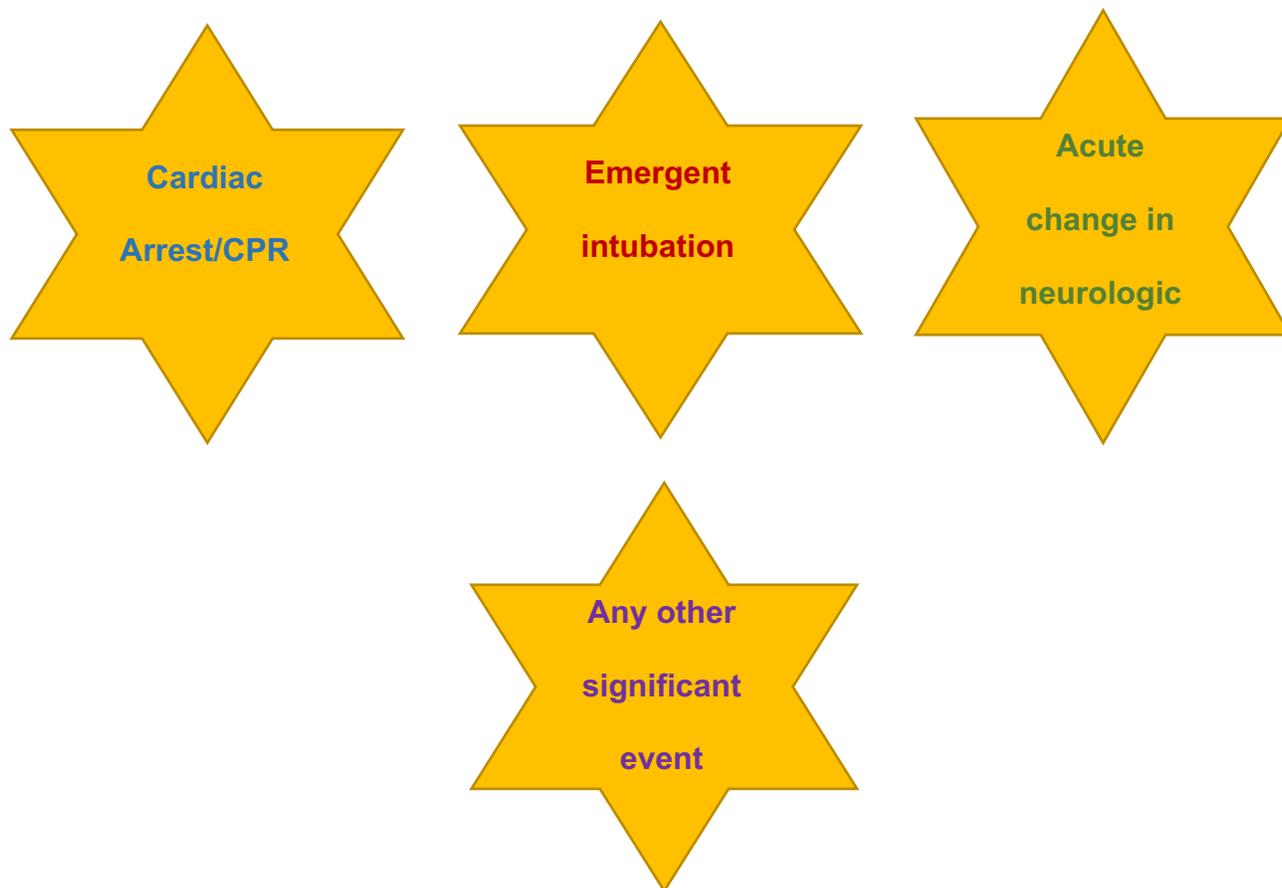
Appendix B

**Debriefing Education Sessions for Project Champions
Sign-Off Sheet**

Name	Signature	Date

Figure 1

Debrief After Events



Debriefing process

- Facilitated/initiated by charge nurses
- Led by MD, NP, charge nurse, fellow
- Performed in unit's break rooms, conference room
- Performed on the same shift an event occurred
- Entire team participates
- <10 minutes
- Debriefing tool is completed

Debrief on "Acute Change in Neurologic Status" including but not limited to:

- active administration of hyperosmolar therapy for elevated or sustained ICP and cerebral edema
- management with verticalization for elevated and sustained ICP required
- active treatment of vasospasm including endovascular procedures and interventions by Neuro ICU team at the bedside
- acute ischemic or hemorrhagic stroke requiring TPA administration, thrombectomy, craniectomy
- any patient neurological decline or change in the neurological status that the medical team considers a need for a debrief