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Implementation of Scripted Debriefings Following Neonatal Delivery Room Resuscitations

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Dedication

This is dedicated to my husband, Jeff; my mother, Brenda; and my boys, Dalton and Garrett.

Acknowledgments

I would like to express a sincere thanks to the NICU management, staff, and medical team where the project was conducted for their support and participation in this project.

Thank you to Drs. Paul Clark and Mary DeLetter for *patiently* guiding me through this DNP project and for always pushing me to excel, even when I was ready to give up. You have been excellent mentors and I cannot express my appreciation enough.

Thank you to Dr. Leann Baker for your friendship and support for so many years. Thank you for encouraging me to pursue this degree and being an amazing mentor.

To Jeff, thank you for keeping me afloat and being more than I deserve. You have been my listening ear and number one cheerleader and you unfailingly support me in every crazy idea I have. I am grateful to have had you by my side for almost three decades now. I love you so much.

To Mom, thank you for a lifetime of unconditional love. I could not have had a better role model in my life than you and I hope you know how much you are loved. You and dad gave me the foundation for everything I have achieved (we know he would have taken all the credit though!), and I could never thank you both enough.

To Dalton and Garrett, my tiny babies, you both make me so proud to be your mom. I hope you both know that you are loved beyond measure and no matter where the future takes you, we will always be here with open arms and love in our hearts.

Abstract

Background: The functioning of neonatal delivery teams can be affected by technical and non-technical skills of individual team members. The team in this project was challenged by varying knowledge and skill levels and did not have a standardized process for debriefing resuscitation events. The literature shows that debriefings can aid in improving knowledge, skills, teamwork, and communication of resuscitation teams.

Purpose: The purpose of this quality improvement project was to implement a scripted, post-resuscitation debriefing with the neonatal delivery team to improve non-technical skills of the resuscitation team and identify challenges to providing optimal care.

Method: Scripted, post-resuscitation debriefings were implemented following deliveries of infants that met inclusion criteria. Team members completed Team Emergency Assessment Measure (TEAM) surveys following qualifying resuscitations before and after the intervention period. During the seven-week intervention period, facilitators conducted debriefings and completed debriefing guides that aided in identifying strengths and areas for improvement for the team.

Findings: Debriefings were completed following just over half of qualifying delivery room resuscitations. Through completed debriefing guides, team strengths and areas for improvement were identified. Guides also provided a consistent way to communicate items requiring follow up. TEAM survey scores did not improve in the post-intervention period. Follow-up surveys revealed benefits of debriefings and a desire by team members to continue the practice.

MeSH terms: medical emergency team, patient care team, hospital rapid response team, neonatal intensive care, resuscitation, communication, evidence-based practice

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Introduction

Many neonatal delivery teams use the American Academy of Pediatrics (AAP) Neonatal Resuscitation Program (NRP) for delivery room resuscitations to prevent or provide early intervention for respiratory failure and cardiovascular collapse (AAP, 2021). Many factors can influence the dynamics and quality of a resuscitation including location, maternal or neonatal conditions, gestational age of the neonate, preparation, equipment availability, and both technical and nontechnical skills of team members (AAP, 2021). In the delivery room, neonatal resuscitation teams must work quickly and efficiently to aid newborns in the transition from intra-uterine to extra-uterine life, with the first 10 minutes of life being crucial for that transition to occur.

NRP describes resuscitations in the newborn as a series of evidence-based steps intended to support airway, breathing, and circulation (AAP, 2021). For most newborns, the initial steps of evaluation, drying, stimulating, and suctioning are adequate care. However, for approximately 10% of all newborns in the United States, additional care is needed for conditions such as prematurity or further resuscitation steps (supplemental oxygen, continuous positive airway pressure, positive pressure ventilation [PPV], intubation, chest compressions, or medications) are needed to achieve breathing and circulation (AAP, 2021). For the purposes of this project, the term *resuscitation* will refer to those birth events that require additional care or resuscitative steps.

Team proficiency and coordination are required for effective resuscitations. Team members must possess the knowledge and ability to perform technical resuscitation skills as well as possess the non-technical skills needed to communicate and perform as part of a team. Non-technical skills such as leadership, effective communication, ability to follow established

procedures or guidelines, situational awareness, and ability to coordinate efforts with other team members are essential to the functioning of the team (Cooper et al., 2010). Deficits in any of these areas can affect the outcomes not only of the resuscitation but result in negative, life-long consequences for the infant.

The neonatal delivery team involved in this project has multiple providers and clinicians who possess varying levels of knowledge and technical and non-technical skills. In addition, there are not consistent processes for debriefing resuscitation events. The literature indicates that personnel with low levels of experience and self-efficacy may not provide effective leadership, communicate effectively, or completely follow resuscitation guidelines in high-pressure situations (Maibach et al., 1996). Additionally, team members with less resuscitation knowledge and experience may not be able to recognize the patient's changing clinical status or anticipate next steps. Without a standardized process, problems may be recognized in the moment, but not dealt with after the resuscitation is complete. For instance, malfunctioning equipment may not be removed from service. Given varying levels of expertise and inconsistent follow up for problems encountered, the delivery team in this project needed a process that would promote new and continuing education for all team members as well as provide a forum for items of concern requiring following up. Post-resuscitation debriefings provide an opportunity for the team to reflect upon and evaluate knowledge, skills, practice, and challenges to improve the efficiency and effectiveness of resuscitations, providing the best care possible for their patients.

The American Heart Association (AHA) and the AAP unequivocally endorse the use of debriefings in programs such as Basic Life Support (AHA, 2020a) pediatric advanced life support (AHA, 2020b), and NRP (AAP, 2021) to improve cardio-pulmonary resuscitation quality, enforce good teamwork habits, and identify areas for improvement. Tannenbaum and

Cerasoli (2013) found a 25% increase in team performance following implementation of a post-resuscitation debriefing. Improvements in communication were identified in multiple studies involving debriefings (Berg et al., 2014; Gougoulis et al. 2020; Rose & Cheng, 2018; Thompson et al., 2018).

Background and Significance

Premature births are those that occur before 37 weeks gestation (Centers for Disease Control and Prevention, 2021). According to the March of Dimes (2020), in 2019, the premature birth rate in Kentucky was 11.3%, which is above the national average of 10.2%. Additionally, Kentucky's infant mortality rate was 6.1%, compared the national rate of 5.7% (March of Dimes, 2020). Infant mortality rates are an overall indicator of health and are influenced by factors such as prematurity, birth defects, low birth weight, maternal complications, and sudden infant death syndrome.

Actions in the delivery room can prevent or contribute to conditions in the newborn like hypoxic ischemic encephalopathy, intraventricular hemorrhage, bronchopulmonary dysplasia, or a myriad of other conditions that impact a patient's health and well-being for a lifetime. Sequelae such as developmental delays, cerebral palsy, and learning difficulties contribute to billions of dollars of annual medical and healthcare expenses, early-intervention services, and special education services (March of Dimes, 2015).

The facility in which this project was implemented is an academic teaching hospital that treats between 15,000 to 20,000 patients per year. The level III Neonatal Intensive Care Unit (NICU) treats newborns requiring additional care after birth related to prematurity, delivery complications, or acute illness. Some newborns are admitted for monitoring of extrauterine transitioning during the first 12 hours of life, and others have a longer length of stay of several

days or weeks, depending on their gestational age and underlying conditions. Preterm and low birth weight infants may require care beyond routine newborn care, such as respiratory, nutritional, and thermoregulatory support. Additionally, term gestation newborns may require admission to the NICU for monitoring and treatment of conditions such as respiratory distress, birth injuries, perinatal asphyxia, congenital anomalies, and concerns for sepsis.

Key stakeholders for this project included members of the neonatal delivery team, consisting of medical providers (pediatric residents and neonatal fellows who are providers in training and practice under the supervision of a neonatal attending physician, neonatal advanced practice providers (N-APP), or neonatal attending physicians), nurses, and respiratory therapists, who are the target population for the debriefing intervention. Stakeholder investment was established by conducting a needs assessment, which consisted of formal and informal interviews with the unit manager and team members of all experience levels, identifying staff concerns and project site priorities. Additionally, members of the neonatal delivery team were invited to provide input regarding debriefings such as location, timing, and content.

As in most teaching facilities, there is an overall culture of acceptance for evidence-based practice changes in both this hospital and nursing unit. However, because of the learning environment and nature of hospital staffing, individual team member skill levels may range from novice to expert, which can affect delivery team functioning. Physicians range in experience levels from attending neonatologists to pediatric residents, with residents and neonatal fellow requiring supervision when participating in resuscitations. N-APPs in this facility function independently and have a minimum of two years of experience in NICU and high-risk delivery room care. Nurses and respiratory therapists on the team possess a wide range of education and experience, which can impact communication and team functioning. Over 25 years ago,

Maibach and colleagues (1996) reported that inexperience in resuscitations could affect performance mastery and self-efficacy, which in turn impacts the quality of care given during resuscitations.

In recent years, the NICU practice has become more evidence-based and has developed multiple quality improvement committees. With support of the medical director and nursing management, the quality improvement committees have conducted several projects, which have helped to shift the culture of the unit to one that is accepting of evidence-based practice changes. This unit culture is a facilitating factor for this project.

Attaining buy-in from influential members of the medical and nursing staffs is essential for a successful quality improvement project. Influential staff members serve as facilitators to the project by promoting the project and its benefits and encouraging an attitude of acceptance. The project leader sought buy-in from medical and nursing staffs by acknowledging and addressing staff concerns regarding inconsistent processes and desires for timely feedback and education stemming from real-life events, expressed from interviews in the needs assessment.

Challenges to implementing the intervention were those common in the inpatient setting when introducing new processes. Sawyer et al. (2016) cited potential provider and staff-related barriers as reluctance to change, unreceptiveness to feedback, fear of repercussions, resistance to additional duties, and lack of time to complete the task when the units are busy. Consideration of those factors was taken in project planning. To proactively avoid potential barriers to change, the project leader had many conversations with providers and staff leading up to the project, seeking input on the location and timing of the debriefing and content of the debriefing tool. To minimize the impact of the debriefings on team members' time, the project leader used scripts to guide the debriefing and assure the discussion was focused on high value content.

Literature Review

Neonates require a different approach to resuscitations than adults. While most adult cardiac arrests stem from trauma or cardiac events, neonates are more likely to require resuscitation due to respiratory failure (AAP, 2021). Although the approach and steps differ from adults, it is still critical to provide high quality resuscitation to achieve optimal patient outcomes. In the neonatal population, NRP is used for both delivery room and resuscitations in neonates up to three months of age. NRP recommends the use of post-resuscitation debriefings to continually improve resuscitation efforts by delivery room and NICU resuscitation teams.

In 2004, The Joint Commission (TJC) published Sentinel Event Alert 30, which addressed infant death / injury prevention during delivery. In this report, TJC (2004) recommended conducting team training and debriefings to teach and evaluate teamwork and effective communication. The timing of this alert was at the forefront of teamwork and non-technical skill research in the U.S. healthcare system and emphasized the importance of these concepts in providing quality patient care.

Nontechnical skills

"Non-technical skills", termed NOTECHS, was first used in European aviation studies in the 1990s to evaluate pilot attitudes and behaviors unrelated to aircraft control (van Avermaete, 1998). The concept of non-technical skills was then quickly adopted by researchers in realms outside of aviation, such as healthcare. Since the original NOTECHS Behavioral Marker System was developed for the aviation industry (Flin et al., 2003), it has since been modified to measure behaviors in specific settings such as trauma teams (T-NOTECHS), robotic-assisted surgeries (RAS-NOTECHS), and non-technical skills for surgeons (NOTSS).

TJC (2004) recommended in Sentinel Event Alert 30 that perinatal teams should institute measures to improve teamwork and communication, which now encompass nontechnical skills of team members. Flin et al. (2008) define NTS as "the cognitive, social, and personal resource skills that complement technical skills and contribute to safe and efficient task performance" (p. 1). Common non-technical skills important for emergency medical teams include leadership, teamwork, situational awareness, and decision making (Cooper et al., 2016).

Communication

Communication, a vital, non-technical skill, affects all aspects of teamwork, resuscitation, and patient care. Each member of the team is responsible for communicating effectively before, during, and after a resuscitation or clinical event (AAP, 2021). Communication should be clear, accurate, concise, and nonjudgmental. Gougoulis et al. (2020) and Rose and Cheng (2018) both reported improved team communication as an outcome when scripted debriefings were utilized. Additionally, in studies with either scripted or structured debriefings, team members reported improvements in communication within the debriefings, in providing patient care, and in error reporting (Berg et al. 2014; Thompson et al., 2018).

Teamwork

Seminal works in the 1990s and early 2000s evaluated team composition, team functioning, and factors that influence teams in both healthcare and non-healthcare settings (Salas et al, 1992, Cannon-Bowers et al., 1995). Salas et al. (2005) extrapolated information from available teamwork studies and described five aspects that affect functioning of teams which include leadership, mutual performance modeling, backup behavior, adaptability, and team orientation. They also describe individual team member attributes that affect team

functioning such as knowledge, experiences, ability to coordinate efforts, and ability to cooperate.

Non-technical skills such as teamwork and its components are essential for quality resuscitations. During a resuscitation, team members must work quickly, efficiently, and in coordination with one another. Individual skills may be ineffective when team efforts lack coordination. Debriefings can reinforce effective teamwork and identify areas for improvement (Gougoulis et al., 2020). Debriefings can promote a culture of teamwork by enhancing communication and creating a supportive environment for team members (Sugarman et al., 2021). In studies that evaluated perceptions of teamwork following initiation of debriefing interventions, teamwork was strengthened (Berg et al., 2014) and teams exhibited improved organization and awareness (Rose & Cheng, 2018). Individual team members felt less role ambiguity and better understood their place as a member of the team (Berg et al., 2014). In a qualitative study by Salih and Draucker (2019), when debriefings were utilized, respondents reported improved communication and perceptions of working better together, along with increased efficiency in completing tasks.

Practice Improvement

Improvement in practice is most often evaluated in terms of performance and knowledge. Increases in individual and team technical and nontechnical skill performance were repeatedly reported in debriefing intervention studies (Couper et al., 2013; Rose & Cheng, 2018; Tannenbaum & Cerasoli, 2013; Zebuhr et al., 2012). Increases in knowledge by nursing and medical personnel were highlighted by Couper et al. (2013) and Zebuhr et al. (2012) following debriefing interventions. In 2013, Cheng et al. used a scripted debriefing in conjunction with resuscitation simulations and compared the results to simulations with non-scripted debriefings.

They found that while there was a greater increase in knowledge, there was no significant difference in clinical performance by the resuscitation team.

Gilmartin et al. (2020) instituted a hot debriefing program in an emergency department. After six months, 100% of the participants felt that the debriefings improved their practice. Comparable results were reported by Bennett et al. (2016) in a NICU setting. The authors attributed these practice improvements to increased knowledge, skill proficiency, and teamwork.

Problem identification

Debriefings provide an excellent opportunity to identify problems that may need to be addressed or investigated further. Common areas for improvement noted in debriefings include equipment issues, knowledge deficits, communication issues, and logistical issues (Rose & Cheng, 2018; Copeland & Liska, 2016; Gilmartin et al., 2020; Gougoulis et al. 2020; Sugarman et al., 2021; Walker et al., 2020). Copeland and Liska (2016) reported a 52% improvement in work-related processes following institution of a post-resuscitation pause with scripted debriefing.

Debriefings

Post-resuscitation debriefings provide opportunities for resuscitation teams to improve proficiency, reduce equipment-related problems, enhance teamwork, and improve communication (Sawyer et al., 2016). The two most common times for debriefings to occur in the hospital setting are following clinical events and following educational simulation scenarios. Debriefings coupled with educational simulations improve resuscitation skills, teamwork, communication, and confidence of team members (Skare et al., 2018). As the project site already has an educational simulation with debriefing system in place, clinical event debriefings will be the focus of this project.

Debriefings can occur any time after an event. When a debriefing occurs immediately or shortly after an event, they are referred to as "hot" debriefings. This type of debriefing typically includes many of the team members involved in the event and have the advantages of minimized recall bias and issues can be quickly identified and addressed (Gougoulis et al., 2020). "Cold" debriefings may occur days to weeks following an event and often include personnel that were not directly involved in the event. Cold debriefings are typically a more appropriate forum to discuss complex issues (Gougoulis et al., 2020). This project focused on hot debriefings, or those that occurred within minutes to hours following a resuscitation and include resuscitation team members.

Debriefings should be limited to content that will enhance patient care in the future. Typical debriefing content includes clinical scenario review, things that went well, opportunities to improve, and identification of issues to address (Walker et al., 2020). Scripted debriefings include a script or debriefing tool to maintain consistency in covered content. This type of debriefing can provide a launching point for reflective team discussions for the benefit of the group and individuals. Utilization of a script also allows for any member of the team to facilitate the debriefing (Gougoulis et al., 2020), which can be a key feature in the continuing success of debriefings in busy units where one designated facilitator may not always be readily available.

Much of the available literature on debriefings in acute care settings are directed toward trauma and surgical teams or adult resuscitations involving hospital rapid response teams. This information provides a solid basis for the benefits and challenges of emergency team debriefings but does not address specific challenges related to neonatal delivery room resuscitation. Gougoulis et al. (2020) addressed neonatal resuscitations, but within the NICU, which may have different influencing factors than those experienced in the delivery room. Bennet et al. (2016)

included debriefings as a component of a delivery room care bundle. Others (Edwards et al., 2015; Fawke et al., 2020; and Sawyer et al., 2016) discussed the importance of debriefings, but not implementation of the practice. No literature was found specifically addressing the implementation of a debriefing activity following neonatal delivery room resuscitations.

While the practice of debriefings is not the sole factor linked to the success of resuscitation teams, they offer opportunities to refine and improve team functioning and patient care. Without debriefings, teams are missing chances to improve overall performance, identify problematic processes or equipment, and provide valuable staff feedback and education (Sawyer et al., 2016).

Evidence Rating

Most of the literature available on the use of scripted or structured post-resuscitation debriefings reflected the use of debriefings as a means of quality improvement. Using the Johns Hopkins Evidence-based Practice Model (Dang et al., 2022), quality improvement articles provide level V evidence. Evidence level V is non-research-based evidence that is often used for improvement of systems and processes. Eleven of the 16 articles evaluated for the literature synthesis were of good or high-quality, level V quality improvement studies (Bennett et al., 2016; Berg et al., 2014; Copeland & Liska, 2016; Gilmartin et al., 2020; Gougoulis et al., 2020; Rose & Cheng, 2018; Skare et al., 2018; Sugarman et al., 2021; Thompson et al., 2018; Walker et al., 2020; Zebuhr et al., 2012). Cheng et al. (2013), provided level I evidence with a prospective, randomized study. The remaining articles provided level II (Couper et al., 2016; Salih & Draucker, 2019), and level III (Couper et al., 2013; Tannenbaum & Cerasoli, 2013). Level I evidence is obtained from a study in which there is manipulation of an independent variable, a control group, and random assignment to either the control group or experimental

group. Level II evidence is evidence obtained from a study in which there was manipulation of an independent variable and a control group but no random assignment to the group; level III evidence is obtained from a study in which there is manipulation of an independent variable but no control group and no random assignment of the participants to either the control or experimental group. (Dang et al., 2022). All articles were of good or high quality.

Summary

The literature overwhelmingly reinforces the usefulness of debriefings in real-world situations. Improvements in communication, teamwork, knowledge, and practice have been repeatedly exhibited in the setting of clinical event debriefings. In addition, debriefings provide resuscitation teams a tool for identifying challenges in providing optimal patient care. Given this evidence, debriefings were conducted in this project to provide opportunities for neonatal delivery team members to improve non-technical skills and identify challenges to providing optimal patient care.

Purpose & Specific Aims

The purpose of this quality improvement project was to implement a scripted, post-resuscitation debriefing with the neonatal delivery team to improve non-technical skills of the resuscitation team and identify challenges to providing optimal care.

Short-Term Aim

- Completion of Team Emergency Assessment Measurement (TEAM) (Appendix A) surveys by delivery team members following 50% of qualifying newborn deliveries for a period of two weeks prior to intervention start.

Intermediate Aims

- During the seven-week intervention period, conduction of debriefings following 75% of qualifying newborn deliveries of infants less than 35 weeks gestation or those that require PPV for neonatal resuscitation and are transferred to the NICU after birth.
- In the seven-week intervention period, identification of two areas for improvement, either educational or procedural, for further action.
- In the three-week post-intervention period, completion of TEAM surveys by delivery team members following 50% of qualifying newborn deliveries for a period of three weeks after the intervention period.
- Overall increase in mean TEAM composite score in the post-intervention period

Conceptual Framework

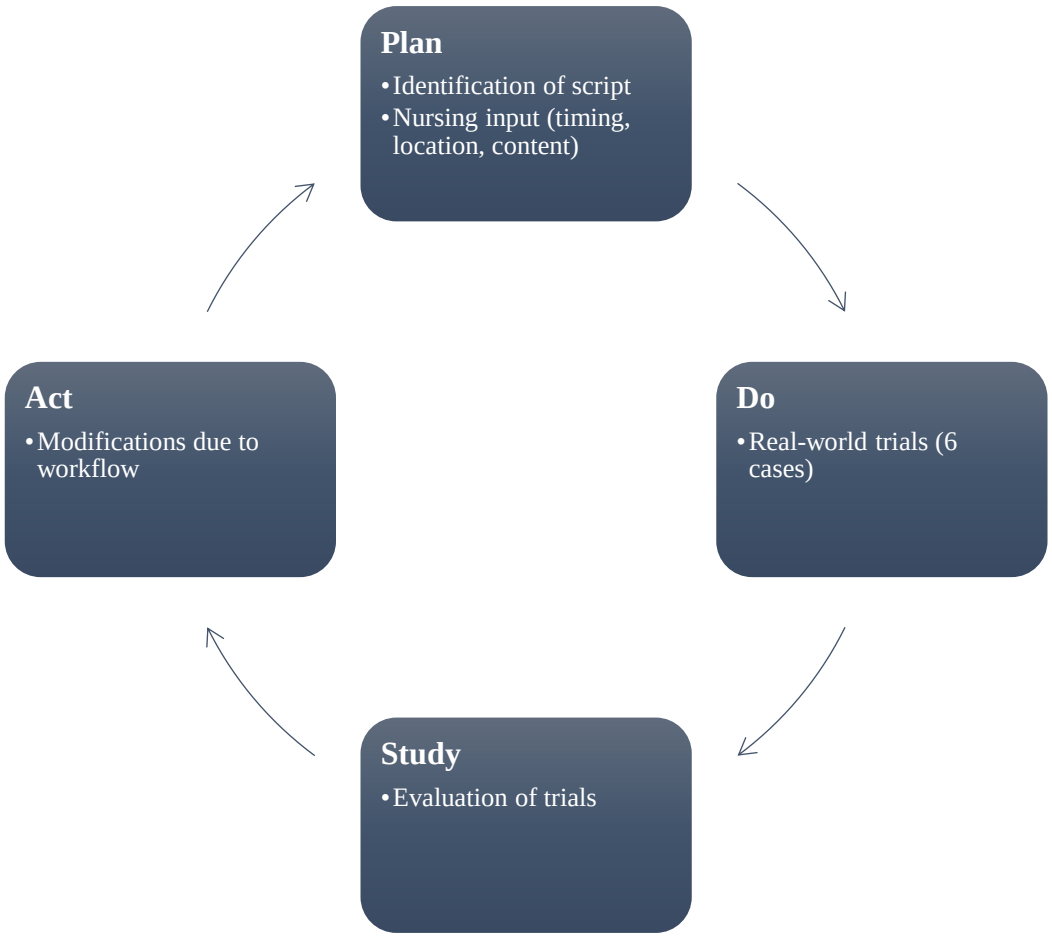
The Institute for Healthcare Improvement (IHI) model for improvement was used for this project. It is based on six components, which include forming the team, setting aims, establishing measures, selecting changes, testing changes, implementing changes, and spreading changes (IHI, 2021).

Plan-do-study-act (PDSA) cycles were used in the testing phase, to evaluate and adjust changes on a small scale before they were implemented on a larger scale (IHI, 2021). In the project planning phase (Figure 1), team members of varying experience levels and shifts were asked for input on debriefing content, length, and locations. The debriefing script contained points for reflection, which staff requested. In the second phase of the PDSA cycle, pilot tests of the process were carried out following 6 resuscitations. Those pilot tests were evaluated in the study phase. In the final phase of the first PDSA cycle of this project, minor changes to location and qualifying resuscitation events were made to accommodate recent changes in staffing and

workflow. Once the changes were in place, staff were agreeable that this was a feasible project for this unit and would benefit the functioning of the neonatal delivery team.

Figure 1

Project Planning

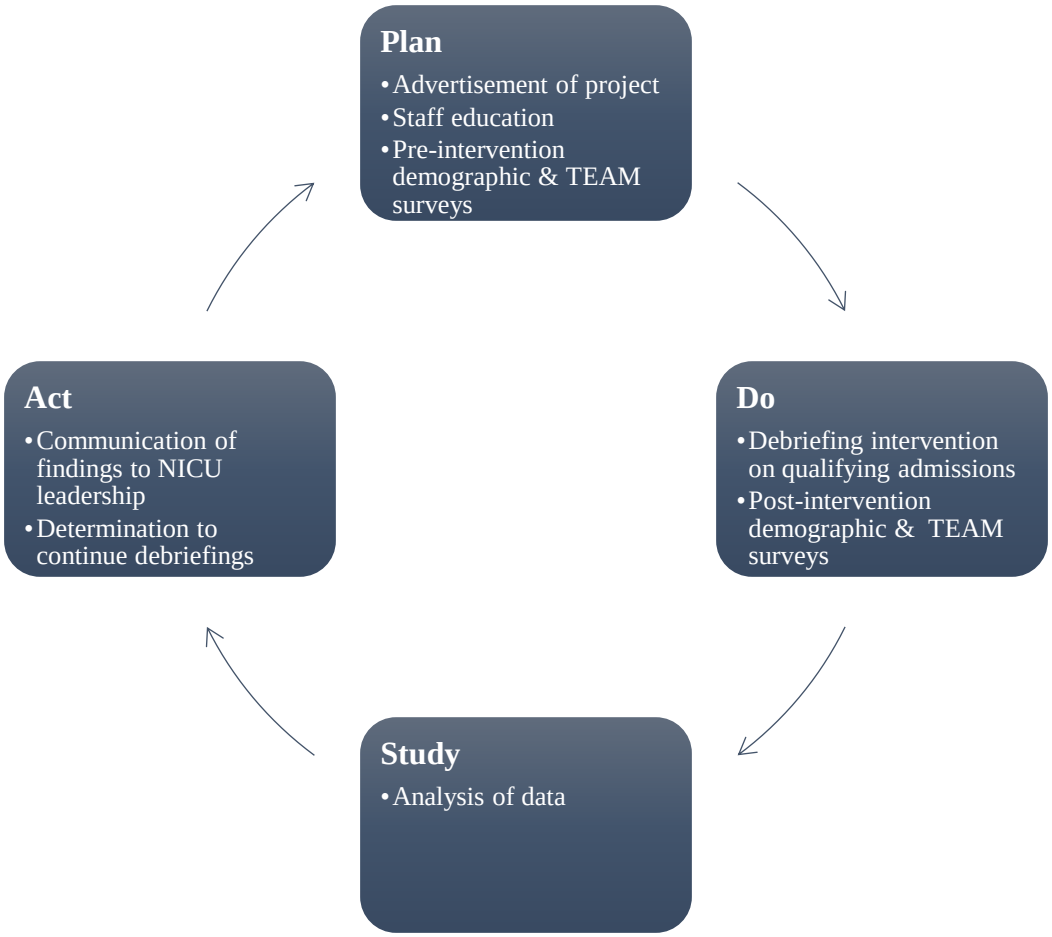


Quality improvement projects often go through multiple iterations of PDSA cycles before they are completed (IHI, 2021; LoBiondo-Wood et al., 2019). As the project moved forward, a second PDSA cycle (Figure 2) began. The planning phase included advertising the project and educating staffs. The second stage of the cycle involved implementing the debriefing intervention following qualifying deliveries. The study phase occurred at the conclusion of the intervention period after completion of post-intervention TEAM surveys. In this phase, the data

obtained from the completed debriefing guides and TEAM surveys were analyzed as discussed below. In the final stage of the second PDSA cycle, findings were communicated to the appropriate leadership members for further action in resolving challenges, providing education, and continuation of post-resuscitation debriefings.

Figure 2

Project Implementation



Methods

Design

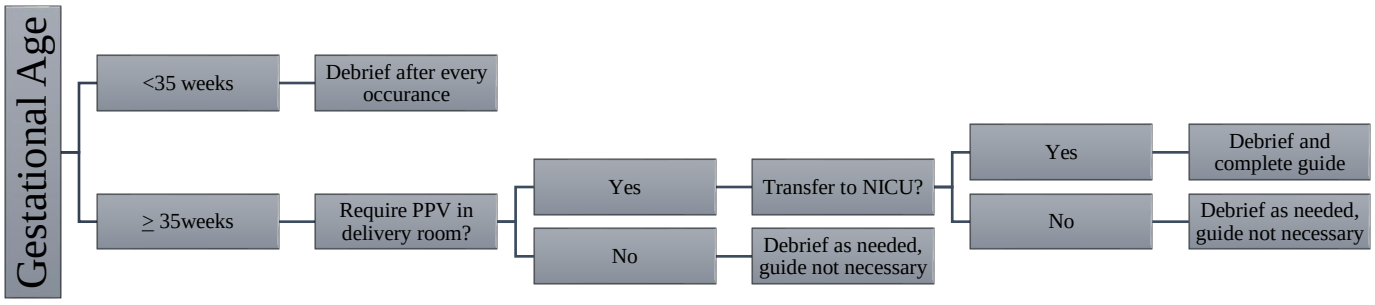
This quality improvement project implemented scripted debriefings following qualifying delivery room resuscitation events. The scripted debriefings were designed to be an adjunct to

the current delivery team routine to improve skills and identify challenges. Because this project aimed to improve existing practices within the facility and because practice changes could be reflected immediately, a quality improvement model was most fitting for this project (LoBiondo-Wood et al., 2019).

Birth event inclusion criteria (Figure 3) for delivery room events included those involving a neonate born at less than 35 weeks gestation, or neonates born at 35 weeks or greater that receive PPV in the delivery room and were subsequently transferred to the NICU from the delivery room or expire in the delivery room. Resuscitation events for infants 35 weeks gestation or greater that did not require PPV in the delivery room or those that required PPV but remained in the delivery room with the mother were excluded from required debriefings. Delivery team participants were asked to complete surveys for two weeks preceding and three weeks following the implementation of the intervention. Data were also collected during the seven-week intervention period using a separate debriefing guide.

Figure 3

Birth Event Inclusion Criteria



Setting

This project took place at an academic teaching hospital that treats between 15,000 and 20,000 patients per year in a midwestern urban setting. Annually, an average of over 1,800

liveborn infants are delivered with an average of 400 - 500 NICU admissions. The project aligned with the facility's mission, vision, and values.

Sample

The resuscitation teams were the NICU-based neonatal delivery team. All members of the NICU staff are expected to function as members of the team and attend deliveries as needed. At the beginning of the project, the NICU staff comprised 74 registered nurses, 11 respiratory therapists, 15 N-APPs, seven neonatal fellows, 11 neonatologists, and 2-3 rotating pediatric residents per month. The N-APPs and neonatologists are part of a large, multi-center neonatology group independent of this facility but located in the same city and provide continuous in-house coverage in this facility.

Intervention Implementation

A debriefing script (Appendix B) and guide (Appendix C) were adapted from that used by Gougoulis et al. (2020). Adaptations were made, with the author's permission, to tailor the script to unit terminology and workflow. Members of the nursing staff with varying levels of experience as well as members of the N-APP team were asked to review and provide feedback on the guide and the script. Both documents received positive overall feedback for content.

Project champions from nursing, respiratory therapy, and medical staffs were recruited prior to the initiation of staff education programs to encourage nursing and medical staffs to complete the education and promote momentum. Champions for the project exhibited leadership and promoted evidence-based care. Four N-APPs and the NICU medical director, along with three nurses and one respiratory therapist per shift agreed to serve as project champions.

Advertising

Project advertisement for nursing, medical, and respiratory therapy staffs began approximately one month prior to project education through scheduled staff meetings and emails.

As a visual reminder for staff in the unit, an educational bulletin board located within the NICU was constructed and placed in the unit in a visible location before the educational sessions commenced. In advertising for the project, to optimize buy-in, focus was placed on benefits for team functioning and identification of barriers to optimal patient care.

Education

Three weeks prior to initiation of the intervention, nursing and medical staffs received education on purpose and value of debriefings and the adapted debriefing script and guide. Education was completed in six sessions over the course of one week. Emphasis was placed on the project purpose, confidentiality, and that debriefings would be a safe space to discuss concerns. For nurses and respiratory therapists, education (Appendix D) was provided in short educational sessions after shift change periods, via email, and using the unit informational bulletin board. Concurrently, medical staff received education (Appendix E) via emails, a PowerPoint presentation, and individual education. Content included intervention, debriefing tools, communication techniques, and circumstances regarding further actions. Education was ongoing throughout the project period on an as needed basis, for instance when one debriefing facilitator had every member of the team complete debriefing guides, when only one needed to be completed for the event.

Pre-intervention Surveys

Concurrently to staff education, pre-intervention demographic surveys (Appendix F) were distributed via institutional emails to nursing, medical, and respiratory therapy staffs. Due to variable staffing and personnel, demographic surveys were not distributed to pediatric residents. These surveys did not collect identifying information. Questions queried participant's

role on the delivery team, age range, gender, and years in current role. The pre-intervention demographic survey was available for one week.

Following staff education and completion of demographic surveys, for two weeks, team members were asked to complete TEAM surveys following delivery room events that meet project inclusion criteria for a debriefing; however, in keeping with the unit practice at the time, debriefings were not performed during this time. These surveys did not collect identifying patient or team member information and were accessed via QR codes that could be scanned with a mobile device. QR codes were located throughout the NICU on project flyers and laminated cards at computer workstations. Participants were asked to provide date and time of infant birth, which were used in linking surveys from the same events and assessing for completeness of information.

Intervention

Scripted team debriefings were held following any deliveries that met inclusion criteria. The intervention period lasted seven weeks, following staff education and gathering of baseline TEAM survey scores. Debriefings were facilitated by the N-APP or physician leading the delivery room resuscitation and were held as soon as possible following the event, and no later than the end of the nursing or provider shift. Using the adapted script, debriefings occurred in the NICU, and patient privacy was maintained. Debriefing guides that accompanied the script were completed by the debriefing facilitator and were not part of the medical records. Completed debriefing guides were returned to a centrally located and secured ballot-type box within the NICU. The project leader compiled completed debriefing guide aggregate data bi-weekly and dispersed findings to the unit manager for follow up.

Provisions were in place for instances that required more extensive debriefings or if staff needed emotional support following the resuscitation. More extensive, multidisciplinary

debriefings, often occur following complex or irregular delivery room events and arranged by the NICU and Labor and Delivery charge nurses. They are typically conducted in a room separate from the nursing units and before the nursing shift ends. Additional emotional support for staff may be needed following births that are traumatic to the staff or result in poor patient outcomes or death. The facility has a previously established protocol involving the chaplaincy department in which immediate emotional support is available for staff and from which mental health referrals can be made. No multidisciplinary debriefings occurred during the project period and the emotional support protocol was not activated.

Post-Intervention Surveys

Demographic surveys were distributed again immediately after the intervention period was concluded and were available for one week. Post-intervention demographic surveys (Appendix G) included the same questions as the pre-intervention survey, but also included questions regarding respondents' exposure to and feeling about debriefings in the NICU.

Concurrently, team members were asked again to complete TEAM surveys for a period of 3 weeks following the intervention period. The post-intervention version was identical to the pre-intervention version and again available via scannable QR codes. During this stage, debriefings were not required and done at the discretion of the team.

Data Collection

Hospital logbooks that are part of facility operations and had been established by the facility prior to and independent of this project were kept in the labor and delivery unit and NICU and included newborn date and time of birth, gender, and APGAR scores. Logbooks and newborn charts were reviewed throughout the project. Pre-intervention data collection included demographic data and TEAM survey administration. Intervention stage data was obtained from

completed debriefing guides. Post-intervention data included demographic surveys and TEAM surveys.

Ongoing.

Logbooks in the NICU and Labor and Delivery unit were reviewed on an ongoing basis to identify births meeting project inclusion criteria. Newborns with gestational ages less than 35 weeks qualified for review based on prematurity. Charts of newborns with 1- or 5-minute APGAR scores of seven or less were reviewed in the PeriWatch® Newborn computer system for resuscitative measures and disposition after delivery room care. Those who received PPV and were admitted to the NICU were considered a qualifying patient encounter. Data collected were entered into a password protected SPPS file.

Pre-intervention.

The separate demographic and TEAM surveys were collected and managed using Research Electronic Data Capture (REDCap) hosted at the University of Louisville and were available to staff via weblinks or QR codes that could be scanned with a mobile device. REDCap is a secure, web-based application for building and managing online surveys. It provides a validated interface for data capture and manipulation as well as export procedures to external statistical programs (Harris et al., 2009, Harris et al., 2019). The surveys were deidentified and links provided for online access were the same for all participants, regardless of role. Survey data were downloaded into password protected SPSS files.

Intervention Stage.

Deidentified debriefing guides, adapted from Gougoulis et al. (2020), were completed by debriefing facilitators each time a scripted debriefing was carried out. Guides collected basic information on type of delivery and associated factors such as significant maternal events, need for therapeutic hypothermia, and use of the hospital infant emergency system. Completed guides

were collected in a locked ballot box located in a main area of the unit that is under constant supervision. Quantitative data from debriefing guides were entered into a password protected SPSS file. Qualitative data was compiled for content analysis. After data collection, the completed guides were kept in a locked box in a locked office. At the conclusion of the project, guides were destroyed via the secure paper management system in place at the facility.

Post-intervention.

Post-intervention demographic and TEAM surveys data were downloaded from REDCap into a password protected SPSS file as done with the pre-intervention surveys.

Budget

As a token of thanks for efforts of the nursing, respiratory therapy, and medical staffs, light refreshments were offered during the educational sessions. These items and paper products had a total cost of $92 and were provided and funded by the project leader.

Measures

Performance of the intervention was measured in terms of the established short and intermediate term aims. Measured outcomes included performance of the debriefing following deliveries meeting inclusion criteria, identification of areas for improvement, and improvements in team resuscitation practices. Pre- and post-intervention TEAM surveys assessed staff experiences with debriefings as well as clinical practice improvements.

Data from the unit logbooks and newborn chart reviews were used to describe patient and event characteristics, such as type of delivery and gestational age. Events were categorized by project stages, yielding total numbers of events for the pre-intervention, intervention, and post-intervention stages.

Categories for both pre- and post-intervention demographic analysis included role on delivery team, primary shifts worked, gender, age, and years of experience in current position. Post-intervention demographic surveys also included questions addressing participation in and continuation of debriefings as well as specific beneficial components of debriefings and under what circumstances should debriefings be conducted.

Instrument

TEAM surveys were utilized to assess delivery team member perceptions of specific components of teamwork, including leadership, communication, and task management. Simon Cooper and a team from Monash University located in Melbourne, Australia, developed the TEAM survey (Cooper et al., 2010) for use specifically with in-hospital emergency medical teams. The survey includes twelve statements addressing aspects of team functioning. Eleven of the statements are rated using a 5-point Likert scale, and categorized into leadership, communication, and task management sections. (Cooper, 2010). The twelfth statement is a global rating in which the reviewer assigns a score of 1-10 to evaluate overall team performance (Cooper et al., 2010). Permissions for use of the TEAM survey were obtained prior to initiation of the project.

The TEAM survey has been validated in simulation settings (Cooper et al., 2010; Cooper & Cant, 2014) as well as clinical settings (Maignan et al., 2016; Cant et al., 2016; Cooper et al.; 2016; Porter et al., 2018), demonstrating content validity, construct validity, concurrent validity, internal consistency, inter-rater reliability, and test-retest reliability (Boet et al., 2019). Boet et al. (2019) did note that clinical studies of the tool were mostly performed in emergency departments and not in other specialties, which may limit generalizability. Instrument reliability, measured by Cronbach's alpha and based on the eleven, five-point questions ranged from 0.78 –

0.95 in validation studies (Cant et al., 2014, Cooper et al., 2014; Cooper et al., 2016; Maignan et al., 2016). Cronbach's alphas were 0.91 in the pre-intervention period and 0.89 in the post-intervention period, which were consistent with previously reported instrument validation.

Mean sum scores for the pre- and post-intervention survey periods were calculated for each of the survey categories, which included leadership, teamwork, and task management. In addition, mean sum scores were calculated for the global rating scores and total composite scores. Team functioning percentages, as percentages of the maximum possible categorical or total scores, are then calculated (Cooper et al., 2014; Copper et al., 2016). Instrument reliability was measured using Cronbach's alpha to establish internal consistency. Inter rater reliability would not be appropriate to measure in this project due to the uniqueness of each resuscitation event and team members.

In consideration of delivery team workflow, it was estimated that 1-3 surveys would be returned per event. Barriers to TEAM survey collection included increased unit acuity or team member workloads, multiple deliveries happening at once, and staff members forgetting to complete the surveys. To facilitate completion of TEAM surveys, QR codes were available throughout the unit for scanning with mobile devices. As the survey was electronic, team members completing the survey were alerted when responses were left empty.

Completed deidentified debriefing guides aided in assessing specific strengths, identifying knowledge gaps, and revealing equipment or process problems. Information from the debriefing guides was used to identify recurrent strengths or barriers in the personnel, logistics, procedure, and equipment categories. Debriefing facilitators also recorded team behaviors that should be replicated or changed. The number of completed debriefing guides were compared

with total number of qualifying events in the intervention stage to assess the project implementation rate.

Data Analysis

Data obtained from the surveys, logbooks, and debriefing guides were collected and entered in password-protected IBM® SPSS® (version 28) files for statistical analysis. Descriptive statistics such as frequencies, percentages, and means were used to analyze quantitative data. Qualitative data were assessed for themes.

Data from births meeting inclusion criteria, obtained from logbooks and PeriWatch® Newborn chart reviews, were compiled and analyzed for basic descriptive statistics, such as frequencies, means, and ranges. Findings from delivery logs and newborn chart reviews were compared to the NICU admission logbook for comparison and assurance of data completeness. Total number of qualifying events for each project phase were used to determine TEAM survey response rates and intervention completion rates.

Pre- and post-intervention demographic questionnaire responses were analyzed using basic descriptive statistics, such as frequencies and percentages. Response rates were calculated based on information provided by the unit manager.

Pre- and post-intervention TEAM survey responses were compiled and analyzed using descriptive statistics. Responses to the 12 survey items were downloaded from REDCap. TEAM overall and categorical (leadership, teamwork, task management) summary scores were compiled with means, standard deviation, and ranges calculated. Inferential statistics were not appropriate for scores analysis due to differences in number of qualifying events and respondents between the pre- and post-intervention periods. Pre- and post-intervention summary score means were compared. TEAM surveys were evaluated for completeness by assessing for empty values in individual responses. Barriers to completion of TEAM surveys included increased unit acuity

and provider workloads, multiple deliveries happening in a brief period of time, and team members simply forgetting to complete the surveys.

Data compiled from the adapted debriefing guide were used to identify equipment, logistical, procedural, or personnel challenges that needed to be addressed by the unit management. Basic descriptive statistics were used to describe the timing, location, gestational ages, associated clinical events, number of clinicians involved, and plus/delta items identified in each resuscitation event.

Qualitative data was evaluated through thematic analysis to identify common threads in the completed debriefing guides Braun & Clarke, 2022; Vaismoradi et al., 2013). After data familiarization, initial codes were created that correlated with plus/delta categories on the guides. Statements recorded in the plus/delta columns of the form were recorded and searched for themes. Items that were recorded at least two times in the same category were identified as themes and named. Individual, unrepeated responses were reported to the unit manager in summary reports but did not qualify as themes.

Debriefing guide data were evaluated for completeness by comparing the number of completed guides and the number of qualifying events. It was not expected that debriefing facilitators would enter responses into every available space on the form, so empty responses did not indicate incompleteness of data. Barriers to completion of debriefing guides included increased unit acuity or debriefing facilitator workloads, multiple deliveries happening at the same time, and loss of completed guide before submission. To facilitate completion of the debriefing guide, paper forms were available in multiple locations throughout the unit, a locked ballot box for collection was available in a central location, and reminders for the medical staff was posted at computer workstations.

Ethical Considerations

Ethical considerations for this project included protections for patient and staff privacy. The project received approval from the university Institutional Review Board and the facility research oversight committee prior to implementation. At the project site, the NICU is a restricted unit, in which only staff, patients, and approved visitors are admitted, thus limiting the exposure of debriefings to non-involved people. Debriefings were held within the NICU at the patient bedside or nursing charting desk.

Demographic and TEAM surveys distributed via REDCap weblinks did not collect personal identifying information. Data from those surveys were available through the REDCap website only to the project leader and downloaded data were kept in password protected SPSS® files.

For ease of participation, debriefing guides were completed on paper forms. Completed debriefing guides and TEAM surveys did not contain identifying information such as patient name and medical record number. During the intervention period, completed debriefing guides were placed in a locked ballot box at the nursing charting desk, where it was under constant supervision by NICU staff. After the data collection period, the completed forms were kept in a locked box in a locked office. Collected data were kept in a password protected SPSS file on a password protected computer. After the project was completed, debriefing guides were destroyed via the facility's secure paper management system.

Results

Qualifying Birth Events

Thirty-nine neonatal delivery records were identified from the labor and delivery logbook and further assessed for inclusion criteria. Through the span of the 13-week project period, 37

records met inclusion criteria. Of those 37 records, eight events occurred in the pre-intervention stage, 25 in the intervention stage, and four were in the post-intervention stage.

Through all stages of the project, gestational ages of the newborns ranged from 23 weeks to 39 weeks, with a mean gestational age of 32.03 ± 4.32 weeks. Births at less than 28 weeks accounted for 13.5% of total deliveries, while births greater than 32 weeks comprised 43.2% of the total. Cesarean section deliveries accounted for 70.3% (n = 26) of the deliveries, with vaginal births comprising the remaining 29.7% (n = 11) deliveries. Just over half of the births (54.1%, n = 20) were on day shift and 45.9% (n = 17) were on night shift. Demographics of qualifying birth events by project stage are summarized in Table 1.

Table 1

Birth Events Demographic Data

Project Phase Group	Pre-intervention	Debriefing	Post-Intervention	Total Sample
Group Size	8	25	4	37
Gestational Age (weeks)				
Range	28 - 31	23 - 39	24 - 39	23 - 39
Mean ± SD	31.63 ± 3.58	32.16 ± 4.39	32.0 ± 6.27	32.03 ± 4.32
Delivery Type				
Cesarean	7 (87.5%)	18 (72%)	1 (25%)	26 (70%)
Vaginal	1 (12.5%)	7 (28%)	3 (75%)	11 (30%)
Neonate APGAR Score (1 minute)				
Range	2 - 8	0 - 8	1 - 8	0 - 8
Mean ± SD	4.63 ± 2.26	4.56 ± 2.52	4 ± 3.16	4.51 ± 2.45
Neonate APGAR Score (5 minutes)				
Range	4 - 9	2 - 9	7 - 9	2 - 9
Mean ± SD	7.13 ± 1.81	7.16 ± 2.08	8 ± 0.82	7.24 ± 1.91
Event Shift				
Day	6 (75%)	13 (52%)	1 (25%)	20 (54%)
Night	2 (25%)	12 (48%)	3 (75%)	17 (46%)

Demographic Surveys

Pre-intervention demographic surveys yielded 27 responses from 118 total distributed links, which is a 22.9% response rate. Post-intervention demographic surveys yielded a total of 10 responses from 108 total distributed links, for a 9.26% response rate. There were almost three times as many participants in the pre-intervention group as in the post-intervention group. Around 90% were female in both groups, about 56% were in the nursing role in the pre-intervention group with a more equal distribution of roles in the post-intervention group. Almost 60% were from the dayshift pre-intervention group with 40% dayshift in the post intervention group, and a more even distribution across ages and years in current occupation in both groups. In examining years of experience in current role, 80% of day shift respondents had greater than five years of experience, while 55% of night shift respondents had less than 5 years of experience. Full pre-and post-intervention demographic data can be found in Table 2.

Table 2

Comparison of Pre- and Post-intervention Provider Demographic Data

Project Phase	Pre-intervention (N = 27)		Post-intervention (N = 10)	
	n	%	*n*	%
Age				
20-29 years	7	25.9	1	10
30-39 years	7	25.9	4	40
40-49 years	8	29.6	5	50
50+ years	5	18.5	0	0
Gender				
Female	24	88.9	9	90
Male	3	11.1	1	10
Role on delivery team				
Nurse	15	55.6	3	30
N-APP/physician	10	37	3	30
Respiratory therapist	1	3.7	4	40
Other	1	3.7	0	0

Table 2 continued

Years in current occupation				
<5 years	7	25.9	3	30
5-10 years	5	18.5	1	10
11-15 years	6	22.2	4	40
16-20 years	3	11.1	1	10
>20 years	6	22.2	1	10
Primary shift				
Day shift	16	59.3	4	40
Night shift	6	22.2	3	30
24-hour shifts	5	18.5	3	30

TEAM Survey Scores

In the pre-intervention phase, eight birth events met inclusion criteria, and TEAM surveys were completed on all qualifying birth events (100%). Four birth events met inclusion criteria in the post-intervention stage, and TEAM surveys were completed following three events (75%). In total, 22 TEAM surveys were completed in the pre-intervention phase following eight qualifying birth events and 15 were completed in the post-intervention phase following the three qualifying birth events that had surveys completed.

Categorical comparison of pre- and post-intervention TEAM survey means and team functioning percentages can be found in Table 3. Decreases in post-intervention mean scores and team functioning percentages were found in all scoring categories. There was a 1.76-point (3.4%) decrease in total composite mean score, which did not meet the intermediate-term goal of increasing the mean total composite score in the post-intervention period. Internal consistency was measured from pre- and post-intervention survey responses.

The post-intervention survey period was extended by one week due to a lack of qualifying events in the first two weeks the survey was open in the post-intervention period. In all, the pre-intervention TEAM surveys are reflective of qualifying birth events within a 2-week

period and post-intervention surveys are reflective of qualifying birth events within a 3-week period.

Table 3

Comparison of Pre- and Post-intervention TEAM Scores

Project Phase Group	Pre-Intervention	Post-intervention
Group Size	22	15
Qualifying Events	8	4
Leadership *(max score 8)*		
Range	3 - 8	4 - 8
M ± SD	7.23 ± 1.27	6.40 ± 1.639
Team Functioning %	90.3	80
Teamwork *(max score 28)*		
Range	21 - 28	20 - 28
M ± SD	26.59 ± 2.52	26.07 ± 2.631
Team Functioning %	95	93.1
Task management *(max score 8)*		
Range	6 - 8	5 - 8
M ± SD	7.59 ± 0.796	7.2 ± 1.082
Team Functioning %	94.9	90
Global rating *(max score 10)*		
Range	7 - 10	7 - 10
M ± SD	8.95 ± 0.999	8.87 ± 1.060
Team Functioning %	89.5	88.7
Total composite *(max score 54)*		
Range	38 - 54	39 - 54
M ± SD	50.36 ± 4.499	48.53 ± 5.125
Team Functioning %	93.3	89.9

Debriefing Guides

Debriefing guides were returned on 13 qualifying birth events (52%) during the intervention period. Infant gestational ages ranged from 23-39 weeks (mean 31.38 ± 4.89). Events were evenly distributed between day and night shifts, 46.2% (n = 6) and 53.8% (n = 7),

respectively. Table 4 lists score ranges and means of associated clinical events, resuscitation measures, special circumstances, and infant dispositions.

Table 4

Debriefing Guide Birth Event Characteristics

Shift	Day	Night	Total Sample
Group size	6	7	13
Gestational Ages			
Range	27 – 39	23 – 37	23 – 39
M ± SD	33.0 ± 5.02	30.0 ± 4.69	31.38 ± 4.89
Associated Major clinical events			
Shoulder Dystocia	1 (16.7%)	1 (14.3%)	2 (15.4%)
Placental Abruption	1 (16.7%)	0	1 (7.7%)
Other	2 (33.3%)	1 (14.3%)	3 (23.1%)
None	2 (33.3%)	5 (71.4%)	7 (53.8%)
Resuscitation Measures			
PPV	5 (83.3%)	6 (85.7%)	11 (84.6%)
CPAP	2 (33.3%)	1 (14.3%)	3 (23.1%)
Intubation	3 (50%)	3 (42.9%)	6 (46.2%)
Chest Compressions	0	1 (14.3%)	1 (7.7%)
Epinephrine	0	1 (14.3%)	1 (7.7%)
Umbilical Lines	0	1 (14.3%)	1 (7.7%)
Therapeutic Hypothermia Required	1 (16.7%)	0	1 (7.7%)
Neonate Ultimate Disposition			
NICU	5 (83.3%)	6 (85.7%)	11 (84.6%)
Newborn Nursery	1 (16.7%)	1 (14.3%)	2 (15.4%)

Qualitative data from debriefing guides was assessed for thematic content. Findings for logistical, equipment, procedural, and personnel can be found in Table 5. Themes for items for replication included communication and teamwork; themes for items for change included ensuring equipment is available/working and prioritizing more thorough debriefings when one is warranted. Specific items identified for improvement included equipment preparation for deliveries, reviewing NRP guidelines, and use of closed loop communication.

Table 5

Debriefing Guide Qualitative Data

	Plus	Delta	Items Requiring Follow-up
Logistical	Adequate time for preparation—staff Adequate time for preparation—room and equipment Role assignment before resuscitation	Insufficient data for analysis	None indicated
Equipment	Necessary equipment available All equipment working properly	Stethoscope missing parts Suction not set-up/functioning Monitors not working off battery power	Specific equipment and monitor identification
Procedural	NRP guidelines followed	Intubations—difficult or multiple attempts required	Education and practice drawing up epinephrine doses
Personnel	Team communicated well Team organized and worked well together	Closed loop communication not used	None indicated

Intervention Follow-up

Intervention follow-up questions were included with the post-intervention demographic surveys. Ten post-intervention surveys were returned, which yielded a 9.26% (N = 108) return rate. Of the ten returned surveys, 80% (n = 8) reported participating in a debriefing during the intervention period. All respondents (n = 10), regardless of previous participation in debriefings, felt that debriefings were beneficial and should continue. Beneficial components of debriefings, as well as circumstance in which respondents felt debriefings should occur are summarized in Table 6.

Table 6

Post-intervention Follow-up Survey Results

Delivery Team Role	Nurse	Respiratory Therapy	N-APP/Physician	Total
Number in Group	3	4	3	10
Participation in debriefing during project period				
Yes	2 (66.7%)	3 (75%)	3 (100%)	8 (80%)
No	1 (33.3%	1 (25%)	0	2 (20%)
Feel debriefings are beneficial to this unit				
Yes	3 (100%)	4 (100%)	3 (100%)	10 (100%)
No	0	0	0	0
Most beneficial debriefing components				
Debriefing Script	1 (33.3%)	0	0	1 (10%)
Debriefing Guide	0	0	2 (66.7%)	2 (20%)
Opportunity for	2 (66.7%)	2 (50%)	3 (100%)	7 (70%)
Education/Questions	2 (66.7%)	3 (75%)	2 (66.7%)	7 (70%)
Promotes Teamwork	2 (66.7%)	4 (100%)	3 (100%)	9 (90%)
Promotes Team Communication	1 (33.3%)	2 (20%)	2 (66.7%)	5 (50%)
Provides Emotional Support	2 (66.7%)	3 (75%)	3 (100%)	8 (80%)
Identifies Areas for Improvement	0	2 (50%)	3 (100%)	5 (50%)
Identifies Faulty Equipment	1 (33.3%)	2 (50%)	3 (100%)	6 (60%)
Provides Opportunity for Praise				
Recommend Continuation of Debriefings				
Yes	3 (100%)	4 (100%)	3 (100%)	10 (100%)
No	0	0	0	0
When Should Debriefings be Performed?				
Preterm birth $\leq$ 28 weeks	2 (66.7%)	1 (25%)	3 (100%)	6 (60%)
Preterm birth 29 - 32 weeks	2 (66.7%)	1 (25%)	2 (66.7%)	5 (50%)
Preterm birth 33 - 35 weeks	1 (33.3%)	0	1 (33.3%)	2 (20%)
All Deliveries Requiring CPAP	0	0	0	0
All Deliveries Requiring PPV	1 (33.3%)	0	2 (66.7%)	3 (30%)
All Deliveries Requiring Intubation	1 (33.3%)	1 (25%)	3 (100%)	5 (50%)
All Deliveries Requiring Chest Compressions or Medications	2 (66.7%)	2 (50%)	3 (100%)	7 (70%)
All Deliveries NICU Team Attends	0	2 (50%)	1 (33.3%)	3 (30%)
Only at Request of Delivery Team or Provider	1 (33.3%)	0	0	1 (10%)

Process Evaluation

TEAM survey completion rates of 50% the in both the pre- and post-intervention periods met the short and intermediate term aims. The pre-intervention completion rate was 100% and the post-intervention completion rate was 75%. Post-intervention TEAM scores did not increase following the intervention period and the corresponding intermediate aim was not met. Scannable QR codes for survey access facilitated survey completion by serving as reminders and providing easy survey access.

Post-resuscitation debriefings occurred following 52% of qualifying delivery room events, which failed to reach the stated project aim of 75% compliance. Barriers to completion of debriefings were not measured, but informally reported to the project leader as those that were anticipated (increased unit acuity or debriefing facilitator workloads, multiple deliveries happening at the same time, team members forgetting to debrief). However, during debriefings, debriefing facilitators were given the opportunity to praise team members as well as provide timely education for practice improvements. When faulty equipment was identified, troubleshooting took place for the cause of the malfunction, or the equipment was removed from service and replaced. Identification of at least two areas for education or improvement was an intermediate-term goal, which was met.

Discussion

Summary

Varying levels of knowledge and skills of delivery team members, coupled with inconsistent processes for identifying and following up on challenges that occurred when providing optimal care, prompted the implementation of scripted debriefings following delivery room resuscitations with this delivery team. Aligning with the project purpose, post-

resuscitation debriefings were successfully implemented in this NICU and provided this unit with the opportunity to strengthen knowledge and skills of team members as well as offered a consistent approach to addressing and following up areas of concern.

Interpretation

There was no increase in categorical, global, or composite TEAM scores between the pre-intervention and post-intervention periods. Mean categorical and global scores all decreased by less than 1 point each in the post-intervention period, and the overall score post-intervention mean decreased by 1.76 points. Both periods had similar score ranges. However, there were fewer post-intervention TEAM surveys than pre-intervention surveys, which may have affected calculated means. Corresponding to decreased mean TEAM scores in the post-intervention period, team functioning percentages also were decreased over all categories. Composite score percentages were decreased by 3.4% between survey periods. TEAM survey responses are subjective, which could be dependent on intrinsic factors such as personality and attitude of the respondents, as well as working relationships between the individual team members. TEAM survey scores may also have been affected by time of day in which their corresponding events occurred. As exhibited by demographic survey results, in this unit, day shift staff overall has more years of experience than night shift staff, which may affect perceptions of events and evaluations of leadership.

Team functioning percentages in the leadership category decreased 10.3% in the post-intervention period. This was more than any other category or total functioning percentage decrease. Resuscitation leadership can vary based on the time of day in which the event occurs. Neonatologists are present in the unit daily during daytime work hours (0730-1630) and on an as needed basis overnight; neonatal fellows are in the unit four to five weekdays during daytime

work hours. N-APPs provide around the clock in-house unit coverage. Delivery team coverage is shared between physicians and N-APPs in the daytime hours, so resuscitations may be led by any of those providers. Evening and overnight resuscitations are most often led by N-APPs. Because of the required training to practice independently in this facility, neonatologists and N-APPs have more years of experience with neonatal resuscitations than neonatal fellows. Higher levels of experience can influence resuscitation performance and self-efficacy (Maibach et al., 1996), which can in turn affect leadership abilities in a resuscitation.

Delivery team members were agreeable to the practice of debriefings following delivery room events and found the practice to be beneficial in providing optimal care in the delivery room and NICU. Staff felt debriefings were particularly helpful in providing education to team members on both an individual and group basis. Similar to the findings of Gougoulis et al. (2020), Rose & Cheng (2018), Berg et al. (2014), Thompson et al. (2018), Sugarman, et al. (2021), and Salih and Draucker (2019), more than half of the post-intervention respondents in this project expressed beliefs that debriefings benefitted the team in terms of improved communication, improved teamwork, process improvement, timely education, and providing team members with praise.

Debriefing guides yielded qualitative information that was used for identification of team, equipment, and logistical strengths and challenges. The guides also provided a consistent process for relaying information to the unit manager. On follow-up surveys, most team members did not recognize benefits of using scripts or guides by the debriefing facilitators. However, N-APPs/physicians would have been the only team members to utilize those tools to recognize their usefulness in facilitating debriefings and maintaining consistency of content. Of the N-APPs/physician respondents, the majority found the debriefing guide to be beneficial, but none

of the N-APPs/physician respondents reported finding the script beneficial. Because most providers reported finding the guide a useful and an effective tool for communicating debriefing findings, it may be prudent to continue use. However, a necessary next step is to adapt and tailor the guide to better meet unit needs. Guides could also be used in lieu of a script, as the process of completing the guide covers the same topics as the script and would continue to limit debriefings to high-value content.

Respondents had mixed feelings regarding which situations should warrant a debriefing. Overall, most responded that debriefings should occur only following delivery room resuscitations that involve infants born at less than 28 weeks gestation and those that require extensive resuscitation measures beyond intubation, such as chest compressions, epinephrine, and umbilical line placement. Comparing these responses with logbook and debriefing guide birth event characteristics, these types of resuscitations are encountered less than 15% of the time. This statistic suggests that when team members encounter less common situations, they desire the education and reinforcement found in debriefings. Given these responses, for longevity of the intervention, criteria for continued post-delivery room resuscitation debriefings should be less inclusive than those for this project (<35 weeks gestion or any gestation requiring PPV).

Limitations

This project met threats to internal validity that are intrinsic to many NICUs. Interactions of the setting and project could have been affected by high unit census, patient acuity, and individual provider workloads as well as occasions in which multiple deliveries were happening in a brief period of time were experienced during the intervention phase. These factors can contribute to tasks outside of immediate patient management to be forgotten or put off until a

later time, which could account for lower than anticipated numbers of completed debriefings. Conversely, in the post-intervention phase, small numbers of qualifying events for TEAM surveys necessitated the post-intervention survey period being extended by one week.

Demographic survey links were emailed to staff on two separate occasions via institutional email addresses. The two surveys were identical for the first five items, which may have been confusing to potential respondents if they had previously completed the pre-intervention survey. Additionally, the post-intervention demographic survey was active at the same time as the post-intervention TEAM survey. It was noted that having two surveys active concurrently may have given the appearance of only one survey needing to be completed at that time.

With the small number of post-intervention demographic surveys returned, it is impossible to know how many individual team members experienced a debriefing during the intervention period. Eighty percent (n = 8) of the post-intervention demographic survey respondents reported participating in a debriefing, but with a response rate of less than 10% of the total team members, that number may not be representative of how many of the entire group participated in a debriefing.

Some team members may not have participated in debriefings during the intervention period, which may have affected internal validity and influenced post-intervention TEAM survey scores by those individuals. To stay true to the original survey questionnaire, no additional items were added to the post-intervention TEAM surveys. However, the addition of an item regarding exposure to debriefings during the intervention period could have helped to better understand post-intervention TEAM scores to more accurately determine if the debriefing intervention truly had no effect on survey scores.

TEAM survey scores for this project could be subject to bias. These scores are based on individual team member perceptions, which could be influenced by any number of situational, social, or team dynamics. Unique situational event characteristics can include degree of neonatal distress, delivery room milieu, physical location of the delivery, time allowed for preparation, adequate staffing, and equipment functionality. All these characteristics can contribute to individual and team functioning (Hunziker et al., 2011) as they complete their assigned tasks and may contribute to bias in survey responses.

TEAM survey leadership component scores (survey questions one and two) assess the team leader's ability to direct the team and maintain a global perspective throughout the resuscitation. These scores are self-reflective for surveys completed by the N-APPs/ physicians that led resuscitations and later completed a survey. A provider may over- or under-estimate their effectiveness in leading the team and maintaining a global perspective. To maintain confidentiality, delivery team role was not asked when participants completed surveys, so role comparisons of leadership scores were not assessed. It is unknown if this may have been a factor for the 10% decrease in the post-intervention team functioning leadership percentage, or if the previously discussed variables in leadership influenced the scores.

Conclusions

In this project, debriefings were found to be beneficial for the neonatal delivery team in identifying strengths and areas for improvement. Debriefings were well received by staff and readily implemented. Debriefing facilitators were able to provide feedback and education to team members, as well as receive feedback themselves, within a brief period of time following delivery room resuscitations. Team members expressed appreciation for the feedback while the event was still fresh in everyone's minds. Identification of missing or malfunctioning equipment

was able to be addressed in a timely manner and the equipment was replaced, fixed, or taken out of service for repair. With some modifications from the construct of this project, debriefings may be sustainable as a continued practice in this unit.

The benefits of debriefings, found through qualitative and post-intervention demographic survey data analysis, could be generalized to other neonatal delivery teams with similar staffing and workflow. This delivery team is based out of the facility's NICU, with the medical provider, nurses, and respiratory therapists for the patient both attending the delivery and providing further care in the NICU. This workflow aided in the availability of team members for debriefings following delivery room resuscitations. Not all teams are staffed or function in this way, which can pose logistical barriers to completion of the debriefing and limit generalizability. When looking to implement practices such as this one, facilities must tailor the process to meet those challenges in order maintain practice sustainability.

This project reinforces previous findings about the benefits of debriefings. Future studies could focus further on implementation of debriefings specifically with neonatal delivery teams or with teams in which members are dispersed to separate locations following delivery room resuscitations. Another consideration for further study would be under which circumstances are debriefings most beneficial to team members. For example, do neonatal delivery team members find debriefings more beneficial following every delivery room resuscitation, or only following those situations that are less frequently encountered such as gestational ages less than 28 weeks or infants requiring extended measures such as chest compressions and medication administration.

Dissemination

At the conclusion of the project, the unit manager was given an executive summary of the project aims, intervention, and findings, from which decisions for continuation and modification will be made. Recommendations were made to continue the practice of debriefings but reduce the criteria for events in which they are performed, and to continue use of a further modified debriefing guide for communication of debriefing findings and items for follow-up. Additionally, the full scope of the project will be disseminated at the student poster session held at an annual local nurse practitioner professional development conference.

References

American Academy of Pediatrics. (2021). *Textbook of neonatal resuscitation* (8 ed.). (G. M. Weiner, Ed.) Itasca, IL: American Academy of Pediatrics.

American Heart Association. (2020a). *2020 BLS Provider Manual.* United States: American Heart Association.

American Heart Association. (2020b). *Pediatric Advanced Life Support.* United States: American Heart Association.

Bennett, S. C., Finer, N., Halamek, L. P., Mickas, N., Bennett, M. V., Nisbet, C. C., & Sharek, P. J. (2016). Implementing delivery room checklists and communication standards in a multi-neonatal ICU quality improvement collaborative. *The Joint Commission Journal on Quality and Patient Safety, 42*(8), 369-377.

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. *Journal of Trauma Nursing, 21*(5), 201-208.

Boet, S., Etherington, C., Larrigan, S., Yin, L., Khan, H., Sullivan, K., Jung, J. J., Grantcharov, T. P. (2019). Measuring the teamwork performance of teams in crisis situations: a systematic review of assessment tools and their measurement properties. *BMJ Quality & Safety, 28,* 327-337. doi:10.1136/bmjqs-2018-008260

Braun, V., & Clarke, V. (2022). Conceptual and design thinking for thematic analysis. *Qualitative Psychology, 9*(1), 3-26.

Cannon-Bowers, J. A., Tannenbaum, S. I., Salas, E., & Volpe, C. (1995). Defining team competencies and establishing team training requirement. In R. Guzzo, & E. Salas (Eds.), *Teams: Their training and performance* (pp. 101-124). Norwood, NJ: Ablex.

Cant, R. P., Porter, J. E., Cooper, S. J., Roberts, K., Wilson, I., & Gartside, C. (2016). Improving the non-technical skills of hospital medical emergency teams: The Team Emergency Assessment Measure (TEAM™). *Emergency Medicine Australasia, 28*, 641-646. doi:10.1111/1742-6723.12643

Centers for Disease Control and Prevention. (2021). *Preterm BIrth*. Retrieved from CDC: https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pretermbirth.htm

Cheng, A., Hunt, E., Donoghue, A., Nelson-McMillan, K., Nishisaki, A., LeFlore, J., Eppich, W., Moyer, M., Brett-Fleegler, M., Kleinman, M., Anderson, J., Adler, M., Braga, M., Kost, S., Stryjewski, G., Min, S., Podraza, J., Lopreiato, J., Fiedor Hamilton, M., Stone, K., Reid, J., Hopkins, J., Manos, J., Duff, J., Richard, M., Nadkarni, V. (2013). Examining pediatric resuscitation education using simulation and scripted debriefing. *JAMA Pediatrics, 167*(6), 528-536.

Cooper, S. J., & Cant, R. P. (2014). Measuring non-technical skills of medical emergency teams: An update on the validity and reliability of the Team Emergency Assessment Measure (TEAM). *Resuscitation, 85*, 31-33.

Cooper, S., Cant, R., Connell, C., Sims, L., Porter, J. E., Symmons, M., Nestel, D., Liaw, S. (2016). Measuring teamwork performance: Validity testing of the Team Emergency Assessment Measure (TEAM) with clinical resuscitation teams. *Resuscitation, 101*, 97-101.

Cooper, S., Cant, R., Porter, J., Sellick, K., Somers, G., Kinsman, L., & Nestel, D. (2010). Rating medical emergency teamwork performance: Development of the Team Emergency Assessment Measure (TEAM). *Resuscitation, 81*, 446-452.

Copeland, D., & Liska, H. (2016). Implementaiton of a post-code pause. *Journal of Trauma Nursing, 23*(2), 58-64.

Couper, K., Kimani, P. K., Davies, R. P., Baker, A., Davies, M., Husselbee, N., Melody, T., Griffiths, F., Perkins, G. D. (2016). An evaluation of three methods of in-hospital cardiac arrest educational debriefing: The cardiopulmonary resuscitation debriefing study. *Resuscitation, 105*, 130-137.

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. *Intensive Care Medicine, 39*, 1513-1523.

Dang, D., Dearholt, S., Bissett, K., Ascenzi, J., & Whalen, M. (2022). *Johns Hopkins evidence-based practice for nurses and healthcare professionals: Model and guidelines.* Sigma Theta Tau International.

Edwards, E. M., Soll, R. F., Ferrelli, K., Morrow, K. A., Suresh, G., Celenza, J., & Horbar, J. D. (2015). Identifying improvements for delivery room resuscitation management: Results from a multicenter safety audit. *Maternal Health, Neonatologyand Perinatology, 1*(2). doi:10.1186/s40748-014-0006-x

Fawke, J., Stave, C., & Yamada, N. (2020). Use of briefing and debriefing in neonatal resuscitation, a scoping review. *Resuscitation Plus*.

Flin, R., Martin, L., Goeters, K.-M., Hörmann, H.-J., Amalberti, R., Valot, C., & Nijhuis, H. (2003). Development of the NOTECHS (non-technical skills) system for assessing pilots' CRM skills. *Human Factors and Aerospace Safety, 3*(2), 95-117.

Flin, R., O'Connor, P., & Crichton, M. (2008). *Safety at the sharp end: A guide to non-technical skills.* Boca Raton: CRC Press.

Gilmartin, S., Martin, L., Kenny, S., Callanan, I., & Salter, N. (2020). Promoting hot debriefing in an emergency department. *BMJ Open Quality*. doi:10.1136/bmjoq-2020-000913

Gougoulis, A., Trawber, R., Hird, K., & Sweetman, G. (2020). 'Take 10 to talk about it': Use of a scripted, post-event debriefing tool in a neonatal intensive care unit. *Journal of Paediatrics and Child Health, 56*, 1134-1139.

Harris, P., Taylor, R., Minor, B., Fernandez, E., O'Neal, L., McLeod, L., Delacqua, G., Delacqua, F., Kirby, J., Duda, S. (2019). The REDCap consortium: Building an international community of software partners. *Journal of Biomedical Informatics, 95*. Retrieved from https://www.sciencedirect.com/science/article/pii/S1532046419301261

Harris, P., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde, J. (2009). Research electronic data capture (REDCap): A metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Informatics, 42*(2), 377-381.

Hunziker, S., Johansson, A. C., Tschan, F., Semmer, N. K., Rock, L., Howell, M. D., & Marsch, S. (2011). Teamwork and leadership in cardiopulmonary resuscitation. *Journal of the American College of Cardiology, 57*(24), 2381-2388.

Institute for Healthcare Improvement. (2021). *How to improve*. Retrieved from Institute for Healthcare Improvement: www.ihi.org/resources/Pages/Howtoimprove

LoBiondo-Wood, G., Haber, J., & Titler, M. G. (2019). *Evidence-based practice for nursing and healthcare quality improvement.* St. Louis: Elsevier.

Maibach, E. W., Scheiber, R. A., & Carroll, M. F. (1996). Self-efficacy in pediatric resuscitation: Implications for education and performance. *Pediatrics, 97*, 94-99.

Maignan, M., Koch, F.-X., Chaix, J., Phellouzat, P., Binauld, G., Collomb Muret, R., Cooper, S. J., Labarere, J., Danel, V., Viglino, D., Debaty, G. (2016). Team Emergency Assessment Measure (TEAM) for the assessment of non-technical skills during resuscitation: Validation of the French version. *Resuscitation, 101*, 115-120.

March of Dimes. (2015). *The impact of premature birth on society*. Retrieved from March of Dimes: https://www.marchofdimes.org/mission/the-economic-and-societal-costs.aspx

March of Dimes. (2020). *2020 March of Dimes report card: Kentucky.* Retrieved from MARCHOFDIMES.ORG/REPORTCARD

Porter, J. E., Cant, R., & Cooper, S. J. (2018). Rating teams' non-technical skills in the emergency department: A qualitative study of nurses' experience. *International Emergency Nursing, 38*, 15-20.

Rose, S., & Cheng, A. (2018). Charge nurse facilitated clinical debriefing in the emergency department. *Canadian Journal of Emergency Medicine, 20*(5), 781-785.

Salas, E., Dickenson, T. L., Converse, S. A., & Tannenbaum, S. I. (1992). Toward an understanding of team performance and training. In R. W. Swezey, & E. Salas, *Teams: Their training and performance* (pp. 3-29). Norwood, NJ: Ablex.

Salis, E., Sims, D. E., Burke, C. S. (2005). Is there a "Big Five" in teamwork? *Small Group Research* 36(5), 555-559.

Salih, Z. N., & Draucker, C. B. (2019). Facilitators and barriers to successful teamwork during resuscitations in a neonatal intensive care unit. *Journal of Perinatology*, 974-982. doi:10.1038/s41372-019-0380-3

Sawyer, T., Loren, D., & Halamek, L. P. (2016). Post-event debriefings during neonatal care: Why are we not doing them, and how can we start? *Journal of Perinatology*, 1-5.

Skare, C., Boldingh, A. M., Kramer-Johansen, J., Calisch, T. E., Nakstad, B., Nadkarni, V., Olasveengen, O., Niles, D. E. (2018). Video performance-debriefings and ventilation-refreshers improve quality of neonatal resuscitation. *Resuscitation, 132*, 140-146.

Sugarman, M., Graham, B., Langston, S., Nelmes, P., & Matthews, J. (2021). Implementation of the 'TAKE STOCK' hot debrief tool in the ED: a quality improvement project. *Emergency Medicine Journal*, 1-6. doi:10.1136/emermed-2019-208830

Tannenbaum, S. I., & Cerasoli, C. P. (2013). Do team performance and individual debriefs enhance performance? A meta-analysis. *Human Factors, 55*(1), 231-245.

The Joint Commission. (2004). *Sentinel Event Alert.* Retrieved September 19, 2021, from Sentinel event 30: Preventing infant death and injury during delivery: https://www.jointcommission.org/resources/patient-safety-topics/sentinel-event/sentinel-event-alert-newsletters/sentinel-event-alert-issue-30-preventing-infant-death-and-injury-during-delivery/

Thompson, R., Sullivan, S., Campbell, K., Osman, I., Statz, B., & Jung, H. (2018). Does a written tool to guide structured debriefing improve discourse? Implications for interprofessional team simulation. *Journal of Surgical Education, 75*(6), e240-e245.

van Avermaete, J. (1998). *NOTECHS: Non-technical skill evaluation in JAR-FCL*. National Aerospace Laboratory.

Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative study. *Nursing and Health Sciences, 15*, 398-405.

Walker, C. A., McGregor, L., Taylor, C., & Robinson, S. (2020). STOP5: a hot debrief model for resuscitation cases in the emergency department. *Clinical and Experimental Emergency Medicine, 7*(4), 259-266.

Zebuhr, C., Sutton, R. M., Morrison, W., Niles, D., Boyle, L., Nishisaki, A., Meaney, P., Leffelman, J., Berg, R. A., Nadkarni, V. M. (2012). Evaluation of quantitative debriefing after pediatric cardiac arrest. *Resuscitation* (83), 1124-1128.

Appendix A

TEAM survey

Team Emergency Assessment Measure (TEAM)

Introduction

This non- technical skills questionnaire has been designed as an observational rating score for valid, reliable and feasible ratings of emergency medical teams (e.g. resuscitation and trauma teams). The questionnaire should be completed by expert clinicians to enable accurate performance rating and feedback of leadership, team work, situation awareness and task management. Rating prompts are included where applicable. The following scale should be used for each rating:

Never/Hardly ever	seldom	About as often as not	Often	Always/Nearly always
0	1	2	3	4

Team Identification

Date: Time: Place:

Team Leader: Team:

Leadership: it is assumed that the leader is either designated, has emerged or is the most senior - if no leader emerges allocate a '0' to question 1 and 2.	**0**	**1**	**2**	**3**	**4**					
1.The team leader let the team know what was expected of them through direction and command	☐	☐	☐	☐	☐					
2. The team leader maintained a global perspective *Prompts: Monitoring clinical procedures and the environment? Remaining 'hands off' as applicable? Appropriate delegation.*	☐	☐	☐	☐	☐					
Team Work: ratings should include the team as a whole i.e. the leader and the team as a collective (to a greater or lesser extent).	**0**	**1**	**2**	**3**	**4**					
3. The team communicated effectively *Prompts: Verbal, non-verbal and written forms of communication?*	☐	☐	☐	☐	☐					
4. The team worked together to complete the tasks in a timely manner	☐	☐	☐	☐	☐					
5. The team acted with composure and control *Prompts: Applicable emotions? Conflict management issues?*	☐	☐	☐	☐	☐					
6. The team morale was positive *Prompts: Appropriate support, confidence, spirit, optimism, determination?*	☐	☐	☐	☐	☐					
7. The team adapted to changing situations *Prompts: Adaptation within the roles of their profession? Situation changes: Patient deterioration? Team changes?*	☐	☐	☐	☐	☐					
8. The team monitored and reassessed the situation	☐	☐	☐	☐	☐					
9. The team anticipated potential actions *Prompts: Preparation of defibrillator, drugs, airway equipment?*	☐	☐	☐	☐	☐					
Task Management:	**0**	**1**	**2**	**3**	**4**					
10. The team prioritised tasks	☐	☐	☐	☐	☐					
11.The team followed approved standards and guidelines *Prompt: Some deviation may be appropriate?*	☐	☐	☐	☐	☐					
Overall:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
12. On a scale of 1-10 give your global rating of the team's non-technical performance	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Comments:_____

_____

Appendix B

Adapted Debriefing Script

Neonatal Post-resuscitation Debriefing Script

Introduction and shared mental model

"We are going to do a quick debriefing of that delivery. It should only take a few minutes. The goal is to improve our performance as a team and the care we provide. Participation is optional. We want you to feel that this is a safe space in which to share your perceptions. Let's start with a description of the key clinical events."

Review the clinical scenario and events and establish a shared mental model (i.e. Shared perception of how delivery should have gone/preconceived goals and disposition for the infant).

What went well and what was challenging?

"OK, let's talk about our performance. What went well and what was challenging?"

- *Were there any issues with the clinical environment or staffing? If so, what?*
- *Were there any issues with availability or functionality of equipment? If so, what?*
- *Did we follow NRP and unit guidelines? If not, why?*
- *What positive actions enhanced the team's performance?*
- *Were staff involved up to date with best practice? Are there any identified training needs?*

What is to be replicated or changed for future events?

"Is there anything that should be repeated or changed in the future to improve our delivery room performance?"

- *Discuss aspects of team performance based on discussion above that would be helpful to replicate or change in the future.*

Are there identified issues which require follow-up?

"What issues (logistical, equipment, procedural, process, personnel) require additional follow-up?"

- *Record issues for follow up on Neonatal Post-resuscitation Debriefing Guide.*
- *Notify charge nurse or unit manager for immediate needs.*

Conclusion

"Thank you for taking the time to participate in this performance debriefing. You are appreciated for everything you contribute to the team."

If you have any questions about this script or the accompanying guide, please contact Kim Knott at 502-541-2167 or kim.knott@louisville.edu.

Adapted from and used with expressed, written permission: Gougoulis, A., Trawber, R., Hird, K., & Sweetman, G. (2020). 'Take 10 to talk about it': Use of a scripted, post-event debriefing tool in a neonatal intensive care unit. *Journal of Paediatrics and Child Health*, *56*, 1134-1139.

Appendix C

Adapted Debriefing Guide

Delivery Room Resuscitation Debriefing Guide

Please use this guide for debriefing following newborn requiring PPV (any gestation) and admitted to the NICU after birth and deliveries of infants less than 35 weeks gestation regardless of resuscitation needs.

This form is not part of the patient chart and does not replace either official safety reports filed in RL Solutions or escalation to the unit manager when required.

Introduction and Shared Mental Model

Debriefing facilitator _____ **Date** _____ **Time**_____

Staff members (optional) _____

_____

Trigger for debriefing: PPV at _____weeks gest/Preterm infant at _____ weeks gest

Associated with major clinical event (shoulder dystocia/prolapsed cord/etc.)? _____

Extent of resuscitation: PPV/CPAP/intubation/chest compressions/epinephrine/umbilical lines

Code Neo? Yes/No **Require cooling?** Yes/No

Disposition of infant: NICU admission/NICU transition/NBN/Deceased

What went well and what was challenging (plus/delta)?

	Positive (+)	Challenging (Δ)	Require follow up?
Logistical (location, staffing, preparation)			
Equipment (availability & functionality)			
Procedural (follow NRP and unit guidelines)			
Personnel (clinical knowledge, teamwork, communication, education needs)			

What needs to be replicated or changed for future events?

_____

_____

Will a more thorough debriefing need to take place? Yes/No (If yes, see charge nurse to arrange.)

Will staff need emotional or psychological support? Yes/No (If yes, dial 0 and initiate Code Lavender to activate hospital chaplain.)

Please place form in locked ballot box on the charting desk next to room 2.
Contact Kim Knott, APRN with any questions. 502-541-2167 or kim.knott@louisville.edu

Adapted from and used with expressed, written permission: Gougoulis, A., Trawber, R., Hird, K., & Sweetman, G. (2020). 'Take 10 to talk about it': Use of a scripted, post-event debriefing tool in a neonatal intensive care unit. *Journal of Paediatrics and Child Health, 56*, 1134-1139.

Appendix D

Debriefing Education Outline for Nursing and Respiratory Therapy

Debriefing Education for Nursing and Respiratory Therapy Staffs

I. Introduction

II. Current status and concerns

- A. Hospital treats more than 17,000 patients per year
- B. 3-year average of 1860 births annually
- C. 3-year average of 430 NICU admissions annually
- D. Delivery nurse position added in the last year
  - 1. Benefits
    - *a) NICU presence in most deliveries*
    - *b) Increased preparedness*
    - *c) Increased delivery room exposure for newer staff*
    - *d) Jump start on unanticipated resuscitations/Code Neo situations*
  - 2. Challenges
    - *a) Not all staff comfortable or experienced with DR care*
    - *b) Communication*

III. Project description and purpose

A. Implement a scripted debriefing following preterm deliveries and DR resuscitations to improve teamwork and identify areas for continued quality improvement.

IV. Debriefings

- A. What is a debriefing?
- B. What can debriefings do for our unit?
- C. What content will be covered?
- D. Who participates?
- E. When?
- F. Where?
- G. What do we need to do?
- H. What if a more extensive debriefing is needed?

V. Debriefing script and guide

VI. TEAM surveys

VII. Project timeline

- A. Week 1—Education
- B. Weeks 2-3—Complete TEAM surveys following qualifying deliveries, 1 per team member
- C. Weeks 4-10—Debriefings following qualifying deliveries, leader to complete 1 debriefing guide
- D. Weeks 11-12—Debriefings as needed, complete TEAM surveys following qualifying deliveries, 1 per team members

VIII. Recap

IX. Questions

X. Conclusion and show of appreciation

Appendix E

Debriefing Education Outline for Medical Providers

Debriefing Education for Medical Staff

I. Introduction
II. Current status and concerns
  A. Hospital treats more than 17,000 patients per year
  B. 3-year average of 1860 births annually
  C. 3-year average of 430 NICU admissions annually
  D. Delivery nurse position added in the last year
    1. Benefits
      a) NICU presence in most deliveries
      b) Increased preparedness
      c) Increased delivery room exposure for newer staff
      d) Jump start on unanticipated resuscitations/Code Neo situations
    2. Challenges
      a) Not all staff comfortable or experienced with DR care
      b) Communication

III. Project description and purpose
  A. Implement a scripted debriefing following preterm deliveries and DR resuscitations to improve teamwork and identify areas for continued quality improvement.

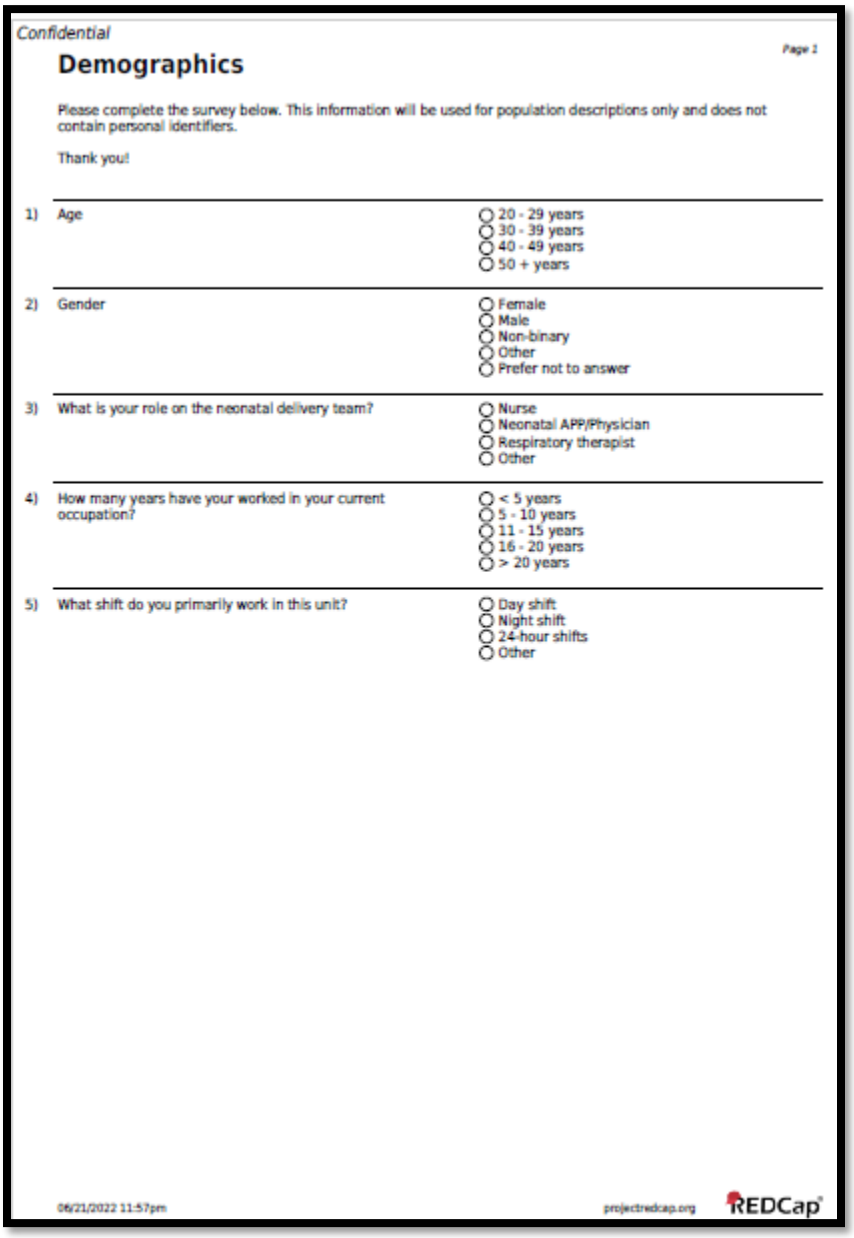
IV. Debriefings
  A. What is a debriefing?
  B. Benefits and barriers
  C. Participants
  D. When and where
  E. Communication techniques for adult learners
  F. Situations warranting debriefings
  G. What if a more extensive debriefing is needed?
    1. Code Lavender
    2. Extended multi-disciplinary debriefing

V. Debriefing script and guide
VI. TEAM surveys
VII. Project timeline
  A. Week 1—Education
  B. Weeks 2-3—Complete TEAM surveys following qualifying deliveries, 1 per team member
  C. Weeks 4-10—Debriefings following qualifying deliveries, leader to complete 1 debriefing guide
  D. Weeks 11-12—Debriefings as needed, complete TEAM surveys following qualifying deliveries, 1 per team members

VIII. Recap
IX. Questions
X. Conclusion and show of appreciation

Appendix F

Pre-intervention Demographic Questionnaire



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Page 1

Demographics

Please complete the survey below. This information will be used for population descriptions only and does not contain personal identifiers.

Thank you!

1) Age
- ○ 20 - 29 years
- ○ 30 - 39 years
- ○ 40 - 49 years
- ○ 50 + years

2) Gender
- ○ Female
- ○ Male
- ○ Non-binary
- ○ Other
- ○ Prefer not to answer

3) What is your role on the neonatal delivery team?
- ○ Nurse
- ○ Neonatal APP/Physician
- ○ Respiratory therapist
- ○ Other

4) How many years have your worked in your current occupation?
- ○ < 5 years
- ○ 5 - 10 years
- ○ 11 - 15 years
- ○ 16 - 20 years
- ○ > 20 years

5) What shift do you primarily work in this unit?
- ○ Day shift
- ○ Night shift
- ○ 24-hour shifts
- ○ Other

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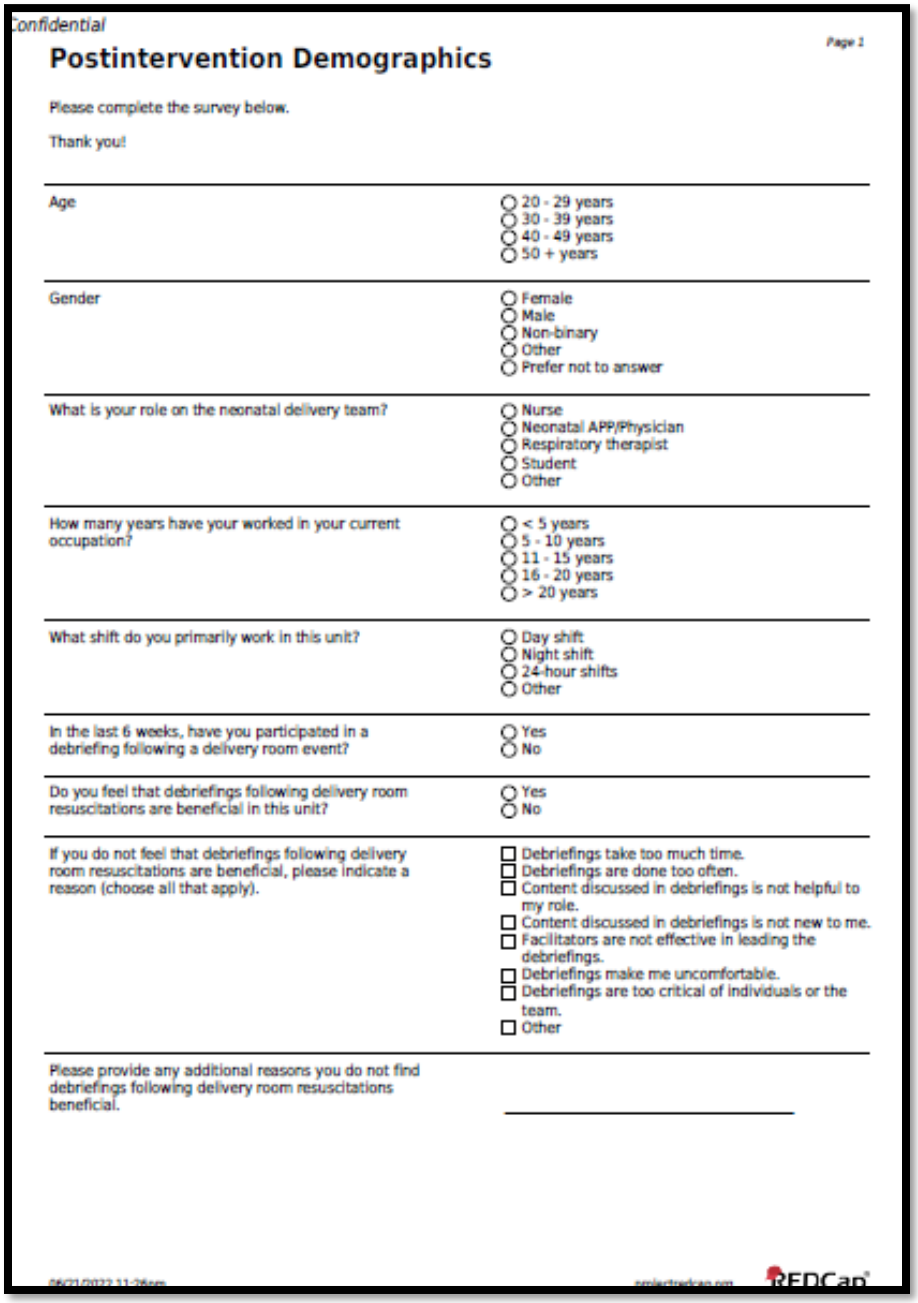
Appendix G

Post-intervention Demographic Questionnaire



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Page 1

Postintervention Demographics

Please complete the survey below.

Thank you!

Age	○ 20 - 29 years ○ 30 - 39 years ○ 40 - 49 years ○ 50 + years
Gender	○ Female ○ Male ○ Non-binary ○ Other ○ Prefer not to answer
What is your role on the neonatal delivery team?	○ Nurse ○ Neonatal APP/Physician ○ Respiratory therapist ○ Student ○ Other
How many years have your worked in your current occupation?	○ < 5 years ○ 5 - 10 years ○ 11 - 15 years ○ 16 - 20 years ○ > 20 years
What shift do you primarily work in this unit?	○ Day shift ○ Night shift ○ 24-hour shifts ○ Other
In the last 6 weeks, have you participated in a debriefing following a delivery room event?	○ Yes ○ No
Do you feel that debriefings following delivery room resuscitations are beneficial in this unit?	○ Yes ○ No
If you do not feel that debriefings following delivery room resuscitations are beneficial, please indicate a reason (choose all that apply).	☐ Debriefings take too much time. ☐ Debriefings are done too often. ☐ Content discussed in debriefings is not helpful to my role. ☐ Content discussed in debriefings is not new to me. ☐ Facilitators are not effective in leading the debriefings. ☐ Debriefings make me uncomfortable. ☐ Debriefings are too critical of individuals or the team. ☐ Other
Please provide any additional reasons you do not find debriefings following delivery room resuscitations beneficial.	_____

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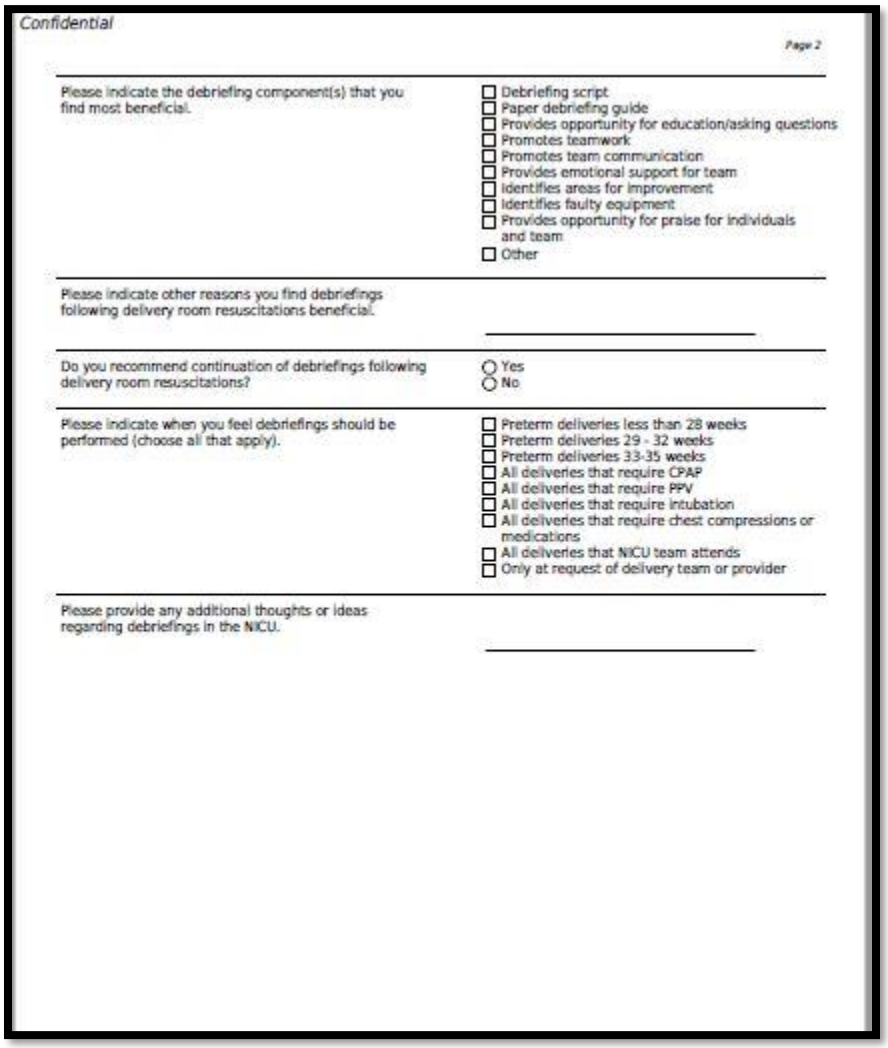
Appendix G (Continued)

Post-intervention Demographic Survey



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Page 2

Please indicate the debriefing component(s) that you find most beneficial.	☐ Debriefing script ☐ Paper debriefing guide ☐ Provides opportunity for education/asking questions ☐ Promotes teamwork ☐ Promotes team communication ☐ Provides emotional support for team ☐ Identifies areas for improvement ☐ Identifies faulty equipment ☐ Provides opportunity for praise for individuals and team ☐ Other
Please indicate other reasons you find debriefings following delivery room resuscitations beneficial.	_____
Do you recommend continuation of debriefings following delivery room resuscitations?	○ Yes ○ No
Please indicate when you feel debriefings should be performed (choose all that apply).	☐ Preterm deliveries less than 28 weeks ☐ Preterm deliveries 29 - 32 weeks ☐ Preterm deliveries 33-35 weeks ☐ All deliveries that require CPAP ☐ All deliveries that require PPV ☐ All deliveries that require intubation ☐ All deliveries that require chest compressions or medications ☐ All deliveries that NICU team attends ☐ Only at request of delivery team or provider
Please provide any additional thoughts or ideas regarding debriefings in the NICU.	_____