Adherence to NRP Guidelines: A Quality Improvement Initiative

by

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Abstract

This quality improvement project aimed to assess the impact of educating labor and delivery nurses (L&D RNs) on adherence to Neonatal Resuscitation Program (NRP) guidelines and hospital policies, with the goal of reducing Neonatal ICU (NICU) resource utilization in the delivery room. A chart audit was conducted for term newborn vaginal deliveries, examining risk factors and NICU resource usage before and after the education intervention. Although the expected 10% decrease was not observed, there was a 4.8% reduction in NICU resource utilization post-education. The chart review identified areas for documentation improvement, while indicating that L&D RNs effectively followed hospital policies and the NRP algorithm, accurately identifying prenatal and fetal risk factors requiring NICU resources. The trend following the education demonstrated a sustained decrease in NICU resource utilization across all deliveries, potentially influenced by decreased NICU usage in term vaginal deliveries and a policy change enabling L&D RNs to care for the newborn during low-risk repeat cesarean sections without calling for NICU resources. This project emphasizes the significance of data collection through chart reviews, ongoing education, and support for L&D staff to ensure the provision of safe and efficient care for newborns. The administration can confidently endorse the development of the NRP program and Essential level provider, supported by the obtained data and outcomes, while adapting policies and spearheading initiatives to advance resuscitation science, educational efficiency, clinical performance, and patient outcomes.

Keywords: clinical practice guidelines; competence; educate; Neonatal Resuscitation Program; nurses

Adherence to NRP Guidelines: A Quality Improvement Initiative

The International Liaison Committee on Resuscitation (ILCOR) and the American Academy of Pediatrics (AAP), in conjunction with the American Heart Association (AHA), create and analyze the resuscitation science of the newly born (Weiner & Zaichkin, 2021). The AAP Neonatal Resuscitation Program (NRP®) Steering Committee disseminates the findings and develops educational materials to help learners acquire the skills and knowledge necessary to implement standardized guidelines in neonatal resuscitation (Weiner & Zaichkin, 2021). Healthcare professionals caring for the newborn at delivery, including registered nurses, respiratory therapists, and physicians, must complete NRP training every two years.

The ILCOR Formula for Survival emphasizes three essential components for the best resuscitation outcomes: guidelines based on sound resuscitation science, effective education of resuscitation providers, and implementation of effective and timely resuscitation (Cheng et al., 2020). According to ILCOR, the newly born infant is transitioning from the fluid-filled environment of the womb to an air-filled environment, and the most critical priority for newborn survival is the establishment of adequate lung inflation and ventilation (Wyckoff & Weiner, 2021). Thus, every delivery of a newly born baby should be attended by at least one person skilled and equipped to provide positive pressure ventilation (PPV) (Wyckoff & Weiner, 2021).

The NRP course provides education on the significant concepts of the NRP algorithm and skills necessary to provide adequate and timely care in the delivery room and has remained unchanged since 2015. However, the 2022 NRP 8th Edition now offers two levels of providers, Advanced and Essential. Advanced Providers are those who attend births and are responsible for the anticipated resuscitation of newborns with known risk factors and for those who participate in neonatal resuscitation beyond PPV. Essential Providers are those involved in caring for newborns and attending deliveries. These providers are responsible for anticipating and preparing for

resuscitation needs and personnel following risk factors, preparation of supplies, initial rapid assessment of neonate, and taking ventilation corrective measures if needed (Weiner & Zaichkin, 2021).

The practice site, a large university medical center, has an 88-bed level IV neonatal intensive care unit (NICU) and a Maternity Pavilion for high-risk antepartum, labor, delivery, and postpartum patients. The administration wants to support labor and delivery nurses (L&D RNs) to be Essential Providers and NICU staff to be Advanced Providers. In addition, the institution seeks to develop a program for Essential Providers and bring the skills sign off and simulation on-site to work with their equipment and team versus staff attending different off-site courses.

However, before developing this program, a perception exists that there were several gaps in providing timely, safe, and efficient care to the newborn in the delivery room. This project will complete chart reviews and provide intervention to close perceived gaps of inconsistent adherence to NRP standardized guidelines on readiness, rapid assessment, and ventilatory support for newborns in the delivery room, and confidence levels in providing transitional care in the delivery room, both resulting in high reliance on NICU/Rapid Response Team (NICU RRT) resources.

Background of Practice Issue

In 1987 NRP provided the first course and has helped over 4.5 million health care providers gain the knowledge and skills necessary to care for neonates who require assistance transitioning to extrauterine life (Weiner & Zaichkin, 2021). Today, over 140 million babies are born annually worldwide (Our World in Data, 2022). According to NRP (Weiner & Zaichkin, 2021), most newborns transition to extrauterine life without intervention. After the natural physiologic stimulation to take their first breath, 85% of term newborns begin breathing within 10-30 seconds after birth and can be placed on their mothers. The percentage of babies breathing

increases to 95% when the infant is stimulated while warming and drying. Data from NRP reveals that approximately 5% of term newborns will need PPV to successfully transition, and 2% of term newborns will need to be intubated to establish an advanced airway. Chest compressions or emergency medications will be needed by 1-3 babies per 1,000 deliveries (Bettinger et al., 2021; Weiner & Zaichkin, 2021; Wyckoff & Weiner, 2021; Wyckoff et al., 2020).

Thirty-five years ago, the NRP course was an 8-hour course focused on didactic learning and skills training for all attendees. In 2011, the class structure changed to an online learning format with a simulated debrief of video recordings followed by in-person simulation. All participants, regardless of role in resuscitation, needed to pass a knowledge exam and demonstrate skills completion for all eleven lessons in the course, ranging from the initial steps of newborn care to providing PPV, inserting an endotracheal tube, giving chest compressions, administering medications, resuscitation, and stabilization of pre-term babies to ethics and care at the end of life.

For many years, providers with NICU resources would question why every NRP provider needed to review and complete all lessons and advanced skills that a NICU resuscitation team would complete. Many providers were trained to perform skills outside their scope of practice or would not do in practice versus concentrating on skills used and need to retain. Studies reveal a decline in trainees' ability to perform NRP skills as soon as two months after an initial training course (Patel et al., 2012). Another study stated deficiencies in basic NRP psychomotor skills and a lack of adherence to the recommended NRP flow diagram steps in actual delivery room resuscitations (McCarthy et al., 2013). NRP faculty acknowledge that a single training experience, as currently required, to maintain provider status every two years is not the best approach (Ades & Lee, 2016).

In acknowledgement of the need for more research on the best approach for skill retention

and varied levels of NICU resources available for immediate response to the delivery room, NRP established two levels of providers in the 2022 8th edition NRP® curriculum. Each institution, based on its situation and policies, will decide whether to allow staff to obtain Advanced or Essential providers (Weiner & Zaichkin, 2021).

At the practice site hospital, L&D RNs call "fetal rapid response/RRT" if risk factors are present before a neonate is born and "neonatal rapid response/RRT" if risk factors arise after delivery prompting a team of a NICU physician (MD)/nurse practitioner (NP), respiratory therapist (RT) and NICU RN to respond immediately. L&D RNs set up warmer and ventilation equipment, attend the delivery, and make initial assessments of newborns to stay with the mother or go to a warmer for further interventions. While L&D RNs are trained to set up T-piece resuscitators and how to provide PPV, there is little opportunity for skill mastery due to very few newborns needing PPV intervention. L&D RNs admit to a decrease in their confidence to correctly apply free flow oxygen or ventilatory measures, such as PPV. With the immediate availability of NICU resources via the RRT, L&D staff admit to a slow drift of inconsistent compliance following the NRP algorithm resulting in varying level of competence when NICU resources are used versus their own.

Significance

The ILCOR, AHA, and AAP have focused on providing the best science to make decisions on the care of neonates. The first step of anticipation relies on identifying risk factors and having the right team at the bedside. Most term newborns successfully transition from fluid-filled lungs to breathing air and need one person focused on their care at the delivery. If a newborn needs unexpected assistance in their transition, the most crucial priority for newborn survival is for staff to establish adequate lung inflation and ventilation (Weiner & Zaichkin,

2021). Given the relative infrequency of newborns who need intensive resuscitations, delivery rooms can be very stressful when newborns require more than routine care. Care teams must know the proper steps of neonatal resuscitation, be able to perform technical procedures, and work effectively as a team (Ades & Lee, 2016). NRP guidance for rapid assessment and initiating interventions, including suction, free flow oxygen, and ventilation, must be standard care by L&D staff. L&D RNs need to be confident and competent in their skills and knowledge of applying ventilation measures to provide safe and timely care to newborns.

Currently, L&D RNs have a varying degree of experience and compliance in following the NRP algorithm in rapid assessment, ventilation interventions, and ongoing assessments resulting in NICU teams being activated too soon and/or too frequently. When NICU response teams of the MD/NP, RT, & RN are activated, these resources are pulled away from other critical care needs in the NICU. The NICU response rate is perceived to be higher than 5-10% of newborns needing team code response stated by NRP.

Needs Assessment

To determine the current practice of L&D nurses at the project hospital, interviews were conducted with the Medical Director, Department Director, educators, managers, L&D nurses, neonatal nurse practitioners, NICU nurses, and respiratory therapists. Discussions with interdisciplinary team members regarding the new Essential Provider for NRP revealed overwhelming agreement that L&D nurses and their care in the delivery room would be enhanced if the hospital offered the NRP Essential course in-house. However, comments from many revealed before changing expectations or NRP provider levels, the skills and confidence of L&D nurses caring for the newborn in the delivery room and the use of NICU RRT resources should be reviewed.

During the SWOT analysis (See Appendix A), several internal strengths and weaknesses associated with this project were identified. First, there is significant research to support using the evidence-based algorithm from the NRP program and hospital policies that require L&D RNs to be NRP providers who are expected to perform infant resuscitation at deliveries. Second, nursing and physician leadership encourage and empower nursing staff to be at their best and believe L&D nursing staff are exceptional in their care of the highest-level acuity of patients across various stages of pregnancy and delivery but believe there may be a lack of confidence in their care of newborns. These administrators, along with department educators and nurses, highlighted "readiness to call NICU" and "initiating ventilation interventions" as factors most significant and thought to be where staff struggle to adhere to the algorithm. Several internal weaknesses were identified for this project. These include inconsistent training and sign-off of NRP knowledge and skills every two years, as well as limited ongoing educational support or simulations, leading to varying levels of comfort and competence in the L&D RNs' care for newborns transitioning to extrauterine life.

Several opportunities and threats were identified when examining external factors associated with this project. Opportunities identified include that NRP now supports two levels of providers that can help L&D RNs focus on necessary skills and knowledge appropriate to their responsibilities in the delivery room. The institution supports providing the NRP course for Essential level providers in-house. An external threat is the inability to measure long-term outcomes within the project's timeframe and complete multiple improvement cycles.

There is enthusiastic support from nursing staff and the organization. Education and resources to support the L&D nursing staff will ensure the success of meeting the objectives of this project and the future implementation of the NRP Essential Provider course.

Problem Statement

While L&D RNs strive to provide the best care for their patients, there is a perceived lack of standardized use of the NRP algorithm that guides readiness, rapid assessment, and ventilatory support for newborns in the delivery room. Despite having access to the Neonatal Resuscitation Program and algorithm, in-house policies, and empowerment from leadership available to NRP providers, individual adherence to the scientific, evidenced-based algorithm and hospital policy is required. Adherence to the NRP algorithm and policies provides safe, efficient, and timely care to newborns in delivery rooms. Providing education and resources to help L&D staff remain competent and confident in their abilities to care for the newly-born will help support the appropriate use of NICU resources in the delivery room.

This Doctor of Nursing Practice (DNP) quality improvement project will reinforce a standardized care approach for best practice using current evidence provided in the NRP algorithm and hospital policies. Preliminary data on NICU resources in the delivery room will be collected and analyzed to support ongoing quality improvement. Outcomes will be shared with the administration for decisions on how to best support the development of the NRP Essential Provider course and ongoing resources to help L&D RNs care for newborns and ensure appropriate use of NICU resources in the delivery room.

Project Question

Will educating nurses on the evidenced-based NRP Essential Provider program guidelines and hospital policies increase adherence to the NRP algorithm and decrease the use of NICU RRT resources?

Population: nursing staff in high-risk Labor & Delivery department in a large academic medical center with Level IV NICU

Intervention: education session based on hospital policies, preliminary data from chart reviews,

and evidence from the Neonatal Resuscitation Program guidelines to support focus on

readiness, risk factors to call for fetal/neonatal RRT, rapid assessment of the neonate,

ventilation interventions including suction, free flow oxygen, and PPV following the

checklist format of the NRP algorithm

Comparison: standard traditional practice/ pre-intervention practice

Outcome: Increase staff RN competence in delivery room management of newborns following

education intervention, as evidenced by a 10% decrease in the reliance on NICU RRT

resources in the delivery room

Time: Within four weeks

Search Methods

This literature search was conducted in two phases. The first phase was to view reference

lists from the NRP program, AHA, and ILCOR guidelines (Aziz et al., 2021; Weiner & Zaichkin,

2021; Wyckoff & Weiner, 2021). The list revealed over two hundred references organized by

AHA and ILCOR into fifteen categories addressing specific topics or management issues related

to neonatal resuscitation. Seven of these categories matched the topics of this project and included

major concepts, ventilatory support/CPAP, oxygen, human system performance/training

frequency, brief, and de-brief (see Appendix B). These seven categories contained twenty-three

references that were retained for further consideration.

The second phase of this literature search was to search databases starting with search

terms from the PICOT question and the reference list guidelines, along with inclusion criteria of

English, full text available, and time frame of the past seven years. Seven years was chosen as the

2022 NRP guidelines did not change much from the research that formed the 2015 guidelines.

Additionally, several older references were retained as foundational studies or primary work that are included in the neonatal resuscitation guidelines, the definitions of concepts, and the analysis of theories.

The database search was initiated using EBSCOhost to search the Cumulative Index to Nursing and Allied Health Literature (CINAHL) database. The term neonatal resuscitation revealed 1,213 results. Boolean terms AND (nursing, nurses, staff nurses) together with AND "Neonatal Resuscitation Program" were added with 234 initial results. References narrowed to twenty-eight results after Boolean operating terms AND was entered with heading terms "education" OR "teaching". A second search revealed forty-one additional results after adding the Boolean term OR followed by (compliance, adherence, nonadherence, noncompliance, concordance), OR (knowledge, competence, competencies, skills, skill retention), and OR (confidence, self-efficacy, self-esteem). Six studies remained after twenty-three duplicates and exclusion criteria were applied. A total of 34 articles were retained for this literature review.

PubMed database was then accessed with the 'Neonatal Resuscitation Program' revealing 352 results. Results narrowed to eighty-one following the same search terms as the previous CINAHL searches. After duplicates and exclusion terms were applied, the remaining fifty results were retained. The Embase database yielded 1,392 results for 'neonatal resuscitation' and four additional studies after previous search terms were applied and duplicates were removed.

TripPro database was searched with 173 results for the "Neonatal Resuscitation Program" from identical criteria as previous searches. After duplicates were removed, there were no new results. However, TripPro was then used to ensure the literature search reached saturation. An additional nine resources were identified.

Lastly, institutional policies were reviewed. Twenty house-wide clinical management and

operational policies of Code White/Blue (CPR), Rapid Response Team (RRT), First Responder

Escalation Team (FRET) Management, and Responsibilities of Code Teams were reviewed. One

grid delineating when to call an OB RRT/Code, Fetal RRT/Code, or Neonatal RRT/Code was

identified and retained along with the policy, Resuscitation of the Newborn.

The first phase of searching guidelines of the Neonatal Resuscitation Program resulted in

twenty-three studies entered into EndNote. In the second phase, the search of databases resulted in

eighty-eight records being added to EndNote. The resulting 129 records were reduced after

duplicates were removed and exclusion criteria of medical education methods, medical procedural

training, medical management, pre-term, anomalies, high risk neonate, NICU care, fetal care,

medical interventions, and RETAIN program were applied. The literature review resulted in sixty

articles retained for this project (see Appendix B).

Review of Study Methods

The literature was appraised for applicability to topics and settings, evidence levels, and

methods applied. The NRP program and algorithm provide clinical practice guidelines developed

from all levels of evidence from an all-inclusive, comprehensive approach synthesized into the

2020 ILCOR International Consensus on CPR and *ECC Science with Treatment*

Recommendations (Wyckoff & Weiner, 2021). Levels of evidence include public and expert

opinions, animal studies, evidence updates, randomized control trials (RCTs), scoping reviews to

systematic reviews. AHA writing groups then review research questions and search strategies, and

develop tables summarizing the research along with Level of Evidence (quality) and Class of

Recommendations (strength). Guidelines are drafted, blind peer reviewed by five subject experts,

open for public comment, and approved for publication by AHA Committee of Science Advisory

and Coordinating Committee and AHA Executive Committee (Aziz et al., 2021; Wyckoff &

Weiner, 2021; Wyckoff et al., 2020). Neonatal resuscitation science and resulting clinical practice guidelines of NRP are credible, trusted, and used as the primary sources to implement, educate, and evaluate practice change.

The highest-level science created the NRP clinical practice guidelines and algorithm. The ILCOR guidelines and assignment of evidence described above carried into recommendations for education techniques, skill retention, quality improvement, and gaps in research (Aziz et al., 2021; Berg et al., 2020; Cheng et al., 2020; Magid et al., 2020). The intent of appraising the remaining literature was not to question resuscitation science or guidelines but rather how the guidelines were applied in translating best practices to teach, apply and evaluate care for newborns and staff providing care. According to Reavy (2016), no single approach to grading the strength of evidence is accepted by all users. However, studies analyzed were on all levels of the hierarchal medical pyramid and four nursing levels (Reavy, 2016, p. 130). RCTs were applied to some studies to compare individual knowledge acquisition, skill retention, or team training. Mixed measure studies attempted to quantify quality measures on the timing of care, skill retention, or staff characteristics of who provided care. Retrospective, exploratory, and observational studies told the stories of quality improvement interventions and clinical practice guidelines initiated to identify how to bring the most effective care into delivery rooms.

Concepts of competence, knowledge, confidence, self-efficacy, compliance, and adherence, along with methods of education and re-education, were explained by scoping reviews, surveyed with concept analysis descriptive studies, exploratory qualitative studies, and interventional trials. Expert advice weighed heavily in study approaches as many authors led several studies over the years. Interestingly, the strength of medical science is found in the highest levels of evidence for the guidelines for care and algorithm, compared to weaker levels of

evidence when reviewing ILCOR recommendations for education efficiency.

Review of Literature

The NRP program is celebrating 35 years of training over 5,730,000 providers world-wide, with 397,000 current active providers (del Moral, 2022). Since 1987, the program has undergone eight renditions as resuscitation science has been enriched from data gathered from care rendered. NRP provider certification is renewed every two years via online learning and skills simulation sign-off by an NRP instructor. The NRP program currently supports 18,500 instructors worldwide (del Moral, 2022). Each NRP instructor adheres to course materials but has varying approaches to signing off providers. However, the responsibility lies within institutions to interpret ILCOR and AHA NRP guidelines, provide their policies on expectations for staff, and determine the amount and type of ongoing education and support for delivery room support.

To acknowledge quality gaps in providing NRP, the current 8th edition of NRP introduced a chapter on quality improvement in delivery rooms (Lee, 2021; Weiner & Zaichkin, 2021). The use of booster education, mini simulations, spontaneous practice sessions, and incorporation of checklists have all been addressed in the literature as different teaching strategies and staff support. In 2022, NRP created two levels of providers to help institutions manage education resources, continuing competency, and skill retention expectations for staff.

The literature search started with an in-depth look at the NRP program and the science behind medical interventions and responses. A cursory review of ILCOR and AHA guidelines highlighted the same themes and concepts surfaced in the needs assessment and discussion with stakeholders at the project site. Competence, confidence, adherence to the NRP algorithm, skill and knowledge decay prevention, and education support for staff are themes that emerged needing an in-depth look.

8th ed Learning Platform

In acknowledging the application of best practices to achieve knowledge and skills acquisition and retention, the NRP 8th Edition introduced a new learning platform. All providers must pass an online knowledge section by completing cognitive learning activities featuring True Adaptive® learning, which continuously adapts to each learner's knowledge and confidence in real-time (Leone, 2020, 2021).

Skills sign-off now occurs by one of two methods. The first and current method remains in-person skills sign-off using team-based simulation with an NRP instructor every two years. The second method, Resuscitation Quality Improvement® (RQI) learning method, requires additional resources and program change. RQI *for* NRP offers low-dose, high-frequency cognitive and skills sessions. Every quarter, skills are performed at the on-site RQI *for* NRP Simulation Station (Leone, 2021).

Standard newborn resuscitation training programs, such as NRP, educate providers in resuscitation and use simulation to train providers using a program-specific resuscitation algorithm. Long-standing education design builds off the premise that standard resuscitation training ensures providers are competent in knowledge and skills.

Competence

According to the American Nurses Association (2010), the public has the right to expect RNs to demonstrate professional competence throughout their careers. According to Duff (2013), discussions of nursing knowledge, skill, patient safety, and ongoing education are usually combined with competence. The absence of competency may lead to errors and severe consequences for patients.

Patricia Benner (2001) defined competence in nursing as the ability to see actions in terms

of long-range goals and plans for the patient with insight into how the nurse's actions will affect or impact the patient. She also stated that most in-services or organizational trainings aim to achieve competency. Levine and Johnson (2014) reinforced Benner's theory that nurses progress in their levels of competence from novice to expert but also highlighted that both individuals and organizations must ensure competent practice.

In a review of more than 20 articles defining competence, competent, and competency, Levine and Johnson (2014) concluded responsibility for ongoing competency is shared between the profession, regulatory bodies, the organization, and the RN. Nurses performing high-risk procedures infrequently or problem-prone procedures should be assessed frequently for continuing competency. Institutions need to provide an environment where nurses are empowered and expected to take responsibility for their competence through self-reflection, seeking out and participating in educational offerings and experiences that will demonstrate continuing competence in all areas of their professional practice. The NRP course helps staff gain knowledge and skill to become competent NRP providers. However, maintaining continuing competence in the care of newborns is the institution's responsibility and staff providing care.

Confidence and Self-Efficacy

White (2009) performed a thorough concept analysis of 'self-confidence', identified related antecedents, defined attributes, and examined consequences. The concept 'self-confidence' has three defining attributes: belief, persistence, and self-awareness. Affirmation and self-affirmation lead to a personal belief in positive achievements and confidence, while self-doubt can lead to decreased confidence. Persistence can be equated with resilience. Self-awareness can help reduce anxiety. Knowing how to remove stress helps individuals participate in the anticipated event by being fully aware of their surroundings, recognizing when to seek help,

preparing, and staying in control. Identifying and supporting the five antecedents to self-confidence of knowledge, support, experience, gearing-up, and success will positively affect confidence levels.

Nursing literature uses self-confidence in the context of strong clinical practice, with reference to skills acquisition, clinical decision-making, professional socialization, collaboration, and autonomy (White, 2009). Interventions that provide education, offer resources, mentor staff, and learn from successes and failures will increase staff confidence in their skills and clinical performance.

One study found improvement in participants' self-assessed ability to perform neonatal resuscitation in communication, leadership, confidence, and technical skills after team NRP training (Malmstrom et al., 2017). Patel et al. (2012) found improvement in overall skill scores and mega code performance with an increasing confidence level after training and Maibach et al. (1996) claimed that although self-efficacy was only one of many characteristics of resuscitation proficiency, it may be one of the most important. Self-efficacy was improved with an increased emphasis on incorporating skills in peer-training, train-the-trainer model, and may also be enhanced by more frequent re-fresher practice sessions (Olson et al., 2015). This study supports the feasibility of an innovative resuscitation training program in increasing resuscitation knowledge and self-efficacy for using positive-pressure resuscitation devices.

Papasan et al. (2022) provided mini-NRP sessions in huddles and on units to facilitate retention and competence through frequent review and remediation of basic neonatal resuscitation skills. The pre-session self-assessment using Likert scale responses indicated that many nurses felt uncomfortable with several essential NRP skills. After hands-on training in mini-NRP sessions, nurses demonstrated competence in skill and reported increased confidence in performing NRP

skills. Results summarized that ongoing remedial NRP skills training improved confidence,

competency, and retention of NRP skills (Papasan et al., 2022).

Self-confidence is a critical component of effective clinical performance and directly

impacts competence. Lack of confidence can hinder safe practice affecting quality performance

and outcomes (Arabani & Salah, 2016). These authors make several recommendations for

boosting confidence with competence, including 1) improve nursing skills as individual

confidence is built up over several events or training sessions, 2) be well prepared, prioritize,

think in advance, and anticipate, make a reminder checklist, 3) practice effective communication,

and 4) enhance skills.

Algorithm, Visual Aids, and Checklists

ILCOR provides resuscitation training and practice recommendations, including a

decision-making algorithm template. The NRP program uses an algorithm to guide staff through

anticipation and readiness, identifying risk factors, initial steps of care of establishing an airway

and ensuring ventilation, and advanced interventions if needed for respiratory failure, circulation,

and drugs (see Appendix C).

Bettinger et al. (2021) reviewed deliveries to identify strategies to support learning that can

enhance adherence to resuscitation algorithms. Two strategies applied to clinical-decision support

during newborn resuscitation were a visual display of a resuscitation algorithm and peer-to-peer

support. The limited literature on this topic suggests that visual displays of a complex algorithm

may be better suited as a tool before the point of care in training and preparation rather than

during an actual resuscitation (Bettinger et al., 2021).

Acknowledging that gathering data in neonatal delivery rooms is complex, an institution

routinely used videos to review quality indicators. To enhance the data retrieved, a checklist was

created and incorporated into staff documentation. The use of checklists during neonatal

resuscitation was found to help improve overall communication and allowed for rapid

identification of issues. Katheria et al. (2013), based on past and present experiences, recommends

using checklists for neonatal resuscitation.

ILCOR Part 7 (Berg et al., 2020) recognizes that little is known about the effect of cognitive

aids on the performance of hospital-based resuscitation teams across different age categories. No

studies were identified evaluating the use of cognitive aids among healthcare teams during cardiac

arrest. However, trauma resuscitation evidence suggests that using cognitive aids improves

adherence to resuscitation guidelines, reduces errors, and improves the survival of the most

severely injured patients. Implementing structured data collection and review improves

resuscitation processes and safe patient outcomes (Lee, 2021).

Compliance and Adherence

Gardner (2015) analyzed the concept of adherence as a complex, multi-disciplinary

concept impacted by elements such as autonomy, self-determination, self-efficacy, and

communication. According to this author, adherence and compliance were found to be

interchangeable and synonymous in healthcare research, possibly due to compliance having a

more negative connotation. Adherence to treatment recommendations is a significant

consideration in patient safety. Non-adherence to treatment plans can lead to ineffective treatment

with increased suffering of patients and increased health care costs (Gardner, 2015).

Several studies revealed nurses' non-compliance with protocols and algorithms. A re-

education intervention and identifying resources for nurses improved compliance scores in all the

studies. One study to improve compliance with evidence-based protocols in an intensive care unit

concluded that extrinsic rewards improved compliance with protocols and resulted in changes in

culture in the unit (Plost & Nelson, 2007). Another study worth highlighting evaluated adherence to the NRP algorithm working from memory compared to subjects using a decision support tool to guide implementation of the algorithm during simulated neonatal resuscitation. Staff using the NRP algorithm exhibit significantly fewer deviations than those working from memory alone during simulated neonatal resuscitation (Fuerch et al., 2015).

The NRP algorithm provides guardrails needed to provide safe, efficient, and timely care. One key point from NRP is that the most important and effective step in neonatal resuscitation is to ventilate the newborn's lungs and only 5% of term newborns will need PPV (Weiner & Zaichkin, 2021). Complex neonatal resuscitations, such as those involving airway intervention, are high-risk and low-occurrence events. The use of NICU RRT resources will be minimized when L&D staff follow the NRP algorithm. The above studies identified educating, supporting, evaluating, and adjusting resources to improve the use and adherence to the NRP protocol. In addition to supporting staff, institutions must review systems and processes to remove barriers to providing safe and efficient care.

Skill and Knowledge Retention and Decay

Donohue (2021), in a scoping review, found six study designs that included skill decay measurement using a reassessment time interval ranging from two to nine months. Five of those studies could not demonstrate significant differences in resuscitation skills performance up to nine months after training. One study found significant improvement in resuscitation skills following a single mastery learning session, although 60% of the students did not maintain that skill performance level for six months. Even though these were not neonatal resuscitation, the findings are worth noting.

A large, multi-national, rigorous, pre-post cohort NRP training study revealed training

significantly improved NRP knowledge and skills. Skills declined more than knowledge over time. An intriguing finding was staff from tertiary centers had a higher level of skill deterioration than staff from a lower-level care facility. The authors attributed this to a combination of factors, including less daily practice or a higher proportion of physicians in tertiary-level facilities, resulting in less frequent participation in actual events or training (Bang et al., 2016).

All studies agreed that limitations of frequent simulation practice and in-frequent exposure to actual high risk-low occurrence resuscitations led to skill decay. Ongoing skills practice and monitoring, more frequent re-testing, and refresher training were recommended to maintain neonatal resuscitation skills to ensure that evidence-based resuscitation reaches the bedside.

Education Interventions

Part 6 of the Resuscitation Education Science (Cheng et al., 2020) addresses evidence to direct the instructional design of educational programs to providers. ILCOR emphasizes three essential components as guidance: Medical Science + Educational Efficiency + Local Implementation = Survival (see Figure 1). Following a review of ILCOR and AHA educational efficiency recommendations, several strategies were reviewed to explore the evidence from different instructional designs that influence clinical performance and patient outcomes.

Figure 1

ILCOR Formula for Survival in Resuscitation

Figure. Formula for Survival in Resuscitation: Key Elements Contributing to Educational Efficiency. ACLS indicates advanced cardiovascular life support, and CPR, cardiopulmonary resuscitation.

Deliberate Practice and Mastery Learning

The instruction design of the NRP program focuses on Deliberate Practice and Mastery Learning. Deliberate practice is a training approach where learners are given specific goals to achieve knowledge and skills, offered immediate feedback on their performance, and ample time for repetition to improve performance is provided. ILCOR defines mastery learning as the use of deliberate practice training and testing that uses a set of criteria to determine a specific passing standard that implies mastery of the tasks being learned. A better understanding of how deliberate practice and mastery learning can be implemented in resuscitation training would help enhance training and patient outcomes. In a scoping review, Donoghue et al. (2021) summarize the current state of knowledge of deliberate practice and mastery learning as teaching methods for resuscitation education. Sixteen studies had mixed results; however, more studies demonstrated a positive association between the use of deliberate practice and/or mastery learning, improved educational outcomes, and less skill decay than other educational methods (Donoghue et al., 2021).

Spaced Learning and Booster Training

Bender et al. (2014) studied the effects of a simulation booster seven to nine months after the NRP course on the performance of skills. The intervention group showed better procedural skills and team behavior fifteen months after the course. The authors noted that the structure and content of the course during the study period were consistent with recommendations of NRP, which support simulation-based training, teaching both technical and nontechnical skills, and following up with structured de-briefing.

Traditional NRP courses that are online testing with in-person simulation every two years are a massed learning approach. ILCOR (Cheng et al., 2020) recommends institutions implement

booster education or simulation if staff are trained in this traditional format. The new format option introduced in 2022, RQI *for* NRP, offers low-dose, high-frequency cognitive and skills sessions with quarterly sign-off. This option comes with an increased financial commitment from participating institutions. Varying approaches and impact on institutions point to a need for future research to determine optimal training intervals while concurrently minimizing costs and ensuring learner engagement over time.

Addressing the Problem with Current Evidence

The NRP algorithm and recommendations for care have not changed in the new 8th edition NRP. Staff at the project site have attained the knowledge and skills required to be NRP certified and renew their certification every two years. One role of L&D RNs includes attending to the newborn at delivery, yet the need to resuscitate a newborn is a high risk-low occurrence event. While a potential need for resuscitation can be anticipated based on identified risk factors, any delivery can be an emergency and staff must be prepared to intervene by ensuring correct equipment and personnel are available. Studies have shown delivery room staff struggle with continuing competence, confidence in retaining their knowledge and skills, and adhering or complying with NRP algorithm (Aziz et al., 2021; Baumgartner et al., 2021; Bender et al., 2014; Bennett et al., 2016; Berg et al., 2020; Bettinger et al., 2021; Cheng et al., 2020; Donoghue et al., 2021; Lee et al., 2014; Papasan et al., 2022; Patel et al., 2012; Sawyer et al., 2014; Yamada et al., 2015). The current literature and QI project will guide the project site to offer resources to L&D staff, including adopting the NRP Essential Provider, supporting the NRP program in-house, and providing intermittent clinical opportunities to maintain staff confidence and competency in the delivery rooms.

Prevention

Skill decay and a decrease in confidence can be prevented. Non-adherence to the NRP algorithm and inefficient use of NICU resources can be minimized. It is not enough to have staff obtain NRP certification every two years to remain competent in their knowledge and skills. Institutions must adopt strategies to measure confidence, competency, and adherence to the NRP protocol. Resources and training opportunities such as mini-series or booster education, along with visual aids at the bedside, are necessary to support staff.

Current management

The practice site has staff attend their NRP course off-site every two years with no ability to oversee the quality of NRP instructors, skills sign-off, and simulation training. The L&D RNs prepare the delivery room environment, identify fetal and maternal risk factors, attend the birth, and call for NICU RRT resources if newborns have issues transitioning to extrauterine life. Educators on the unit provide training for new equipment and communicate any changes to policies. Due to Covid restrictions staff were unable to have in-person staff meetings or skills training and there were no education plans for booster education or spaced learning clinical opportunities. Additionally, at this time, there are no outcome measures or data gathered on the use of NICU resources and the care of newborns in delivery rooms.

Current Recommendations

Take Home Messages in the ILCOR guidelines and Part 6: Resuscitation Education Science (Cheng et al., 2020) call out recommendations that institutions must consider adopting based on the best evidence available. Adopting a deliberate practice and mastery learning model during resuscitation training, offering booster training, and implementing spaced learning opportunities are recommended to improve skill acquisition and retention for many critical tasks. Additionally, using tools and visual aids, such as the NRP algorithm, during resuscitation training promotes

skill acquisition and retention. Encouraging the use of checklists to standardize care and collect data is highlighted in the new Quality Improvement chapter of the 8th edition NRP course (Lee, 2021; Weiner & Zaichkin, 2021; Weiner & Zaichkin, 2022).

Project Aims

Specific aims of this project are to:

1. Collect pre-data, for four weeks prior to the project implementation, on the use of NICU RRT resources as evidenced by chart review from the electronic health records (EHR) and L&D RNs' documentation in the newborn delivery record

2. Provide an educational seminar for the L&D RNs

3. Decrease the use of NICU RRT resources in the delivery room by 10%, as evidenced by chart review from the EHR and L&D RNs' documentation in the newborn delivery record over a four-week period

Project Objectives

In the timeframe of the DNP project, the host site will anticipate the completion of the following to meet the aims of the project:

1. Identify and provide resources for L&D RNs to ensure safe and efficient care for all newborns in the delivery room

2. Develop and execute education session to review hospital policies, NRP Essential Provider standards of care, the NRP algorithm in a checklist format, and historical preliminary data

3. Evaluate the L&D RNs' adherence to the NRP process and hospital policies, measured via pre & post review of interventions and NICU resources in the EHR report, and chart review of the newborn delivery record

Implementation Framework

The implementation framework for this quality improvement project is the Plan-Do-Study-Act (PDSA) quality model (see Appendix D). The PDSA cycle is a systematic method to measure if an implemented change has improved a process, product, or service (W. Edwards Deming Institute, 2022). The simple design can measure the impact of change on a small scale before implementing it in the larger population (Agency for Healthcare Research and Quality, 2022). Each Plan-Do-Study-Act cycle is a small test of change that is planned and measured in rapid time frame cycles. The small test of change allows for the planned change to be adopted, altered, or stopped. The cycles are flexible to the size of the problem and time length. Each cycle builds upon the previous PDSA cycle, which results in continuous process improvement (see Appendix D).

Development of PDSA Theory

The PDSA model is traced back to Galileo Galilei, the father of modern science, who conducted designed experiments focused on scientific methods (Moen & Norman, 2010). During the 1900s, the American pragmatism philosophy influenced Walter Shewhart's work when he published his scientific writings focused on a sensible, realistic, and practical approach to process improvement. He described the process of specification, production, and inspection in a straight line before revising the process into a cyclical format (Shewhart, 1939). Walter Deming built off Shewhart's cycle when he stressed the importance of constant interaction among the four steps of design, production, sales, and research (Deming, 1950). This work, often referred to as the "Deming Wheel," included the cyclical process of designing, making, selling, and testing the product. This change model was modified from its original form by Associates in Process Improvement (API) under the direction of Dr. Deming and has now been utilized by hundreds of

healthcare associations to accelerate improvements within the organizations (IHI, 2022a). The "Deming Wheel" or the Plan-Do-Study-Act (PDSA) cycle is used to help organizations develop a hypothesis of what changes to implement and measure to improve patient outcomes.

Applicability of PDSA Theory to Current Practice

Deming was an early adopter of acknowledging that process measurement is as important as measuring outcomes to identify how and what needs to be improved. He encouraged managers to use data to evaluate the effectiveness of processes and systems when results were negative or not expected versus blaming individuals (Hall & Roussel, 2017). Deming (2000) noted that most hospitals did not adopt his ideas of systems thinking, process review, and moving away from blaming individuals for many years. The findings from the PDSA cycle can assist individuals, teams, administration, and stakeholders in determining if planned interventions result in the intended change to the process under review.

Major tenets of the PDSA cycle

The PDSA cycle begins with focusing on the problem or what is trying to be accomplished. The next step is determining how to test the change to know that an improvement has been identified and no unintended effects have occurred. Lastly, analysis or evaluation is needed to identify what difference can be made that will result in improvement. The PDSA cycle is applied systematically and continuously as a method to make a change and an evaluation of the effectiveness of that change (Hall & Roussel, 2017).

Plan

The Plan phase must start with a plan of who, what, where, when, and why. The quality improvement project begins with an idea, problem, or research question. A multi-disciplinary team should be gathered with leaders and roles identified. Evidence-based literature needs to be

analyzed and key stakeholders included. A needs assessment, staff interviews, and financial

implications should be completed and studied to ensure buy-in and to establish value for the time

and resources needed to carry out the PDSA cycle. The project's aim must be detailed, along with

objectives, questions, and predictions. The process is designed and formalized in the planning

phase.

Do

The Do phase is the implementation phase, or the time spent to carry out the plan.

Problems, unexpected observations, and data points need to be documented. Once the data is

gathered, a preliminary analysis can begin. The team needs to be present with a hands-on

approach to ensure the plan is being followed and if the change should continue. The initial data

collected along the way are discussed and analyzed throughout this phase. The planned action or

intervention can be stopped, adjusted, or continued throughout this process.

Study

Data analysis is the focus of the Study phase. The team should answer questions such as:

"Did the plan result in an improvement?" and "Was the investment worth the results?". It is

crucial to analyze the data for trends and possible unintended side effects (Hall, 2022; IHI, 2022).

The plan's questions, objectives, and predictions are compared, summarized, and disseminated.

Act

The final phase, Act, closes the loop of the PDCA cycle. This step is meant to reflect on

the cycle's intended or unexpected observations and determine what was learned during the entire

process. The team can make simple decisions to adopt, modify, expand, or stop a tested change. A

more complicated PDSA cycle may require the team to start a new cycle, adjust their goals,

change the methods, re-formulate the theory, or expand the learning and findings into a more extensive implementation plan (W. Edwards Deming Institute, 2022).

Application of PDSA Theory to the DNP Project

The PDSA theory can be applied to this DNP quality improvement project focused on providing safe, confident, and efficient care of newborns in the delivery room. This project is completing a small test of change, a single PDSA cycle of one intervention, along the continuous process improvement continuum of future PDSA cycles. This first PDSA cycle was based on presumptions and qualitative comments but will be foundational in data collected for continued quality improvement measures.

Plan

During the planning phase, interviews were conducted with key stakeholders, and a SWOT analysis was completed. A multi-disciplinary team of MDs, RTs, RNs, and hospital leadership was assembled. The group decided to focus on resources available for L&D RNs to remain competent and confident in their care of newborns and to evaluate the use of neonatal resources in the delivery room. The guidelines of the NRP program, hospital policies, and evidence-based literature were analyzed. Personnel from IT and EMR development joined the team to help map charted interventions and personnel present at deliveries for data collection. Pre- and post-EMR reports and chart review elements from the newborn delivery record were identified and will be adopted for use.

Do

An education session will be provided for the nursing staff to focus on the guidelines of the Essential Provider NRP standards of care and the algorithm in a checklist format. Findings from the preliminary chart audit data, current policies, and practices regarding risk factor

identification, when to call NICU resources for help, and where to document interventions will be highlighted during staff participation in mock scenarios. In addition to content review, time will be spent highlighting the skills required for L&D RNs to provide the necessary interventions to newborns in the delivery room.

Study

A pre-intervention EMR report will be generated, and a chart review of the newborn delivery record will be completed to collect primary data on the use of NICU RRT resources. It will include data for four weeks prior to implementation. Post-implementation data will be collected after the project is completed. During this phase, the preliminary data collected before the intervention will be compared to the data collected after the education intervention. This pre- and post-data will be analyzed to determine if the education session and resources provided to the L&D RNs resulted in a decreased reliance on NICU RRT resources in the delivery room. The team will disseminate the findings to the stakeholders, leadership, and staff.

Act

This PDSA cycle is a small intervention to offer resources for L&D RNs to improve their abilities to provide safe and efficient care for all newborns in the delivery room. The team will review the new primary data, reflect on any intended or unexpected observations, and determine what was learned during the cycle. At the beginning of this PDSA cycle, it was recognized that the primary data gathered would be used to guide program development on a larger scale.

If the project is successful, it is anticipated that the leadership team will continue to support education and resources provided to the L&D RNs and decrease reliance on the NICU RRT resources. A new PDSA cycle will be re-applied after the team identifies a new focus that will include future needs and planned changes (IHI, 2022b). It is anticipated that several more

PDSA cycles will be completed as the practice site develops a more robust program to support L&D RNs in the delivery room, including simulation and the NRP Essential Provider Program on-site.

Population of Interest

The direct population of interest are the Registered Nurses (RNs) at the practice site who attend deliveries on the Maternity Pavilion. These Labor & Delivery RNs, who are active NRP providers, will be involved in the education session and continued care at the bedside. Registered nurses, who are not active NRP providers, or on other units at the practice site, will be excluded from participating in this project.

The indirect population of interest are the newborns delivered on the Maternity Pavilion. Newborns born in the Emergency Room or outside the hospital will be excluded. NICU RRT resources are called to attend cesarean section deliveries and all deliveries for neonates under 36 weeks' gestation. Therefore, only newborns delivered vaginally and at least 36 weeks' gestation will be included in the project.

Setting

The practice site is a faith-based academic teaching university supported by a Magnet-designated Medical Center and Children's Hospital. The organization has six hospitals and outpatient services that deliver quaternary care to the largest county in Southern California. The Children's Hospital is ranked Best Maternity Hospital by Newsweek and The Leapfrog Group (Brandon, 2021). The High-Risk Maternity Pavilion contains OB ER triage, an Antepartum unit, Labor & Delivery, and two Post-Partum units with an integrated newborn nursery. The level IV Neonatal ICU is an 84-bed department supporting over 3,000 births annually.

The L&D RN attends to the mother during labor and delivery and is responsible for

reviewing any maternal or fetal risk factors that indicate the need to call for NICU resources before delivery. The OB physician team and the L&D RN attend to the mother during delivery. An additional L&D RN attends the delivery but is dedicated only to the newborn. This RN is responsible for providing transitional care to the newborn and calling NICU RRT for additional support if needed. The NICU RRT resources include an MD/NNP, RT, and RN. When requested to participate in a delivery, they leave their responsibilities in the NICU to respond to the call from L&D for additional support. When the NICU RNs and RTs leave their assignments in the NICU, they must be covered by additional staff, which causes interruptions in care and increases the need to hand-off care to other providers.

The practice site uses EPIC electronic health records. The mother's chart contains the newborn delivery summary, all charted information about the labor, delivery, and initial newborn statistics. After delivery, the newborn is assigned a medical record, and care documentation is independent of the mother's chart.

Stakeholders

The first stakeholder to acknowledge is the L&D RN. The L&D RNs, as the direct care providers, were included in the needs assessment and informally surveyed throughout the process to elicit ideas and gather support for future change. The director of the Maternity Pavilion and the OB Medical Director participated in the needs assessment, approved the project, and will adjust policies if needed after the project. The L&D managers and charge nurses oversee the day-to-day operation of the shift, ensure policies are followed, and provide staffing and resources available for patient care. They were included in the needs assessment and will help sustain the education resources for the staff.

The OB Educators provide education, onboarding, and training to the Maternity Pavilion

staff and work on all program changes or policy edits through committee. They participated in the needs assessment and their support is critical to a successful implementation of this project's intervention as they coordinate the schedule for the education plan for the Maternity Pavilion and grant access to any in-person or online training. The educators will also be responsible for sustainment of the education interventions and ongoing resources for the staff caring for newborns in the delivery rooms.

The IT EPIC team supports all electronic devices and networking needed to document deliveries and create data reports. The team helped make the data reports and approve access to the EMR delivery summaries. Lastly, the Research Council agreed to support the project (see Appendix E) and authorized the use of the project site via the Affiliation Agreement (see Appendix F).

Interventions

The planning team for this project, led by the DNP student, included experts at the project site. The Director of the Maternity Pavilion and the educators reviewed education materials and coordinated schedules to prioritize the education session during their quarterly mandatory staff meeting. The IT department created the chart review tool and approved data collection from the organization's EHR. The institution's Research Council expert consultants guided the application process and provided site and project approval for the QI project. The Project Mentor, a Ph.D.-prepared nurse at the project site, and the TUN Project Faculty guided all project phases.

Minimal resources were needed to plan the project, provide education for the L&D staff, and analyze the data to determine if NICU RRT resources were decreased. There are no additional financial implications to replace staff during the quarterly meeting or for additional salary for participating in the education session as the intervention is incorporated into part of the education

plan for the department's annual budget. The infant warmer and delivery equipment are available in every delivery room and nursery. Resources for staff members will be available electronically to reduce printing costs.

The project consisted of four phases: project preparation, pre-implementation, implementation, and post-implementation conclusion with the dissemination of findings (see Table 1). The established project timeframe (see Appendix G) includes January-February as pre-implementation, with the month of March encompassing the intervention and post-intervention data collection. Data analysis and conclusion of the project will occur during the months of April to June.

Table 1

Outline of Implementation

Week 1 Implementation 3/2-8/2023	• The week begin with reminder by the leadership team during shift huddles to attend mandatory staff meetings during this week. • Provide education intervention to L&D nursing staff during mandatory staff meeting via zoom coinciding with initiation of project implementation. • Record education session and place in electronic file to be available every day and every shift for staff that did not attend the session and for reference. • Place NRP checklist algorithm in delivery rooms and nursing station. • Infant warmer with equipment and supplies made available in nursery for staff to review their skills. • Post historic baseline data on NICU RRT resources and missed charted elements for poster on the staff information board and provide to put in staff newsletter. • Respond to any inquiries from leadership or staff.
Week 2 Implementation Data Collection 3/9-15/2023	• Implementation continues with reminder announcements by leadership team during huddles to support use of the NRP algorithm checklist, required charting, and availability of infant warmers to practice. • Perform chart review of vaginal term deliveries from week 1 post-intervention. • Compile data into the Excel database created by the project lead. • Response to any inquiries from leadership or staff by the project lead. • Ensure NRP checklist algorithm in delivery rooms and nursing station. • Ensure warmer in nursery is stocked for staff to practice skills.

Week 3 Data Collection 3/16-22/2023	• Perform chart review of vaginal term deliveries during week 2 post-intervention & compile into Excel database. • Response to any inquiries from leadership or staff by the project lead. • Ensure NRP checklist algorithm in delivery rooms and nursing station. • Ensure warmer in nursery is stocked for staff to practice skills.
Week 4 Data Collection 3/23-29/2023	• Perform chart review of vaginal term deliveries during week 3 post-intervention & compile into Excel database. • Respond to any inquiries from leadership or staff by the project lead. • Ensure NRP checklist algorithm in delivery rooms and nursing station. • Ensure warmer in nursery is stocked for staff to practice skills.
Week 5 Data Collection 3/30-4/5/2023	• Perform chart review of vaginal term deliveries during week 4 post-intervention & compile into Excel database. • Respond to any inquiries from leadership or staff by the project lead. • Ensure NRP checklist algorithm delivery rooms and nursing station. • Ensure warmer in nursery is stocked for staff to practice skills.
Week 6 Data Analysis	• Begin analysis of the data by project lead utilizing the IBM SPSS program. • Compare pre- and post-intervention data.

The education session will be part of the mandatory staff meeting in the first quarter of 2023 for staff on the Maternity Pavilion. A formal reproducible PowerPoint presentation will be used as a guide for the education session, including scenarios for staff to incorporate hospital policies and the NRP algorithm checklist into their responses. The discussions and electronic resources will introduce baseline data and reinforce the location of critical elements required in the Delivery Summary. A question-and-answer period will be available at the end of the session for staff to clarify any concerns. Members of the leadership team will be available to ensure accuracy of answers pertaining to management issues. Additionally, an infant warmer in the nursery will be dedicated for staff to practice equipment set-up and skills necessary to care for newborns in the delivery room. The Maternity Pavilion educators and team leaders will be available to assist staff if needed.

Tools

Sources for collecting data, charting required elements, using the NRP algorithm, and supporting educational opportunities for staff currently exist within the organization. However,

the specific tools to implement and measure outcomes for this project did not exist and needed to be developed.

Data Collection Chart Audit Tool

After a review of available chart audit tools within the organization's EHR system, it was determined that no report had been developed to audit data on newborns in the delivery room or the use of NICU RRT resources. The project lead needed to be granted a security level that would allow access to the data. The project lead and the EPIC IT team created a data collection tool (see Appendix H). The neonatal RRT team members, L&D RNs, NRP instructors, and educators were content experts who validated that the elements extracted from the EHR were appropriate.

The primary data was contained within the Newborn Delivery Summary and the hospital's EHR system for data collection purposes. The Delivery Summary contains the nurses' documentation describing the mother's labor and delivery and the initial information on the newborn's transition to extra-uterine life. The elements collected on all deliveries will be patient ID, method of delivery, gestational age, indication for induction if applicable, L&D complications if any, amniotic fluid color, Apgar score at one and five minutes, resuscitation interventions, the timing of skin-to-skin initiation, and whether NICU RRT resources were called for delivery.

The IT department helped to develop the tool that allowed for systematic and accurate data collection from the chart audit that mapped the validated charted elements from the EHR to a downloadable format (see Appendix H). The project lead created a data codebook (see Appendix I) with expert help from a member of the Research Council, Ph.D. faculty, and educators to categorize charted responses. The data was cleaned and coded inside Excel software (see Appendix I). If data elements were missing from the electronic download, the patient ID was used to access the Delivery Summary and complete a manual chart review. In order to minimize any

compromise of HIPPA information from the EHR, the data element patient ID was removed from the data files after the manual chart reviews were completed.

Education Intervention Handout Materials

The PowerPoint presentation will include the following reference handouts for staff to follow during the educational session. The file will be uploaded to the education portal for continual reference (see Appendices J-M).

Hospital Policies

The hospital policies for Code Activation and Criteria for Calling OB/Neonatal/Fetal Rapid Response Team (see Appendix J) will be included. In general, code and rapid response policies are in place to guide staff when to call for an escalated response on patients who have declined to the point of needing emergency intervention. The educators for the Maternity Pavilion and the NICU developed these department specific policies to create a guide to standardize communication expectations between the NICU and Maternity Pavilion and when to call for NICU RRT resources in the delivery room.

NRP Algorithm Checklist

The NRP program uses an algorithm to guide staff through anticipation and readiness, identifying risk factors, initial steps of care of establishing an airway and ensuring ventilation, and advanced interventions if needed for respiratory failure, circulation, and drugs. The project lead enhanced the NRP Algorithm (see Appendix C), with a checklist to guide L&D RNs step-by-step on when to call NICU RRT (see Appendix K). The curriculum and algorithm from the NRP program (Weiner & Zaichkin, 2021; Wyckoff & Weiner, 2021; Wyckoff et al., 2020), together with input from neonatal RRT team members, L&D RNs, NRP instructors, and educators ensured content validity for the checklist enhanced NRP algorithm.

Charting Elements

During the creation of the chart audit tool, the IT EPIC team needed to identify where the data was mapped from in the Delivery Summary. Working with the educators and L&D RNs, the Delivery Summary was reviewed, and the location of the required charting elements was identified. Screenshots from sections of the Delivery Summary will be included in the education session to highlight the areas to chart required data (see Appendix L). The first section highlights the charting section for induction indications and labor complications. The following section to document the presence of meconium is read-only in the Delivery Summary and mapped from a separate flowsheet. The final section includes screen shots on where to document whether NICU was called, if any interventions were needed, and timing of when the newborn could go to its mother.

Baseline Data

No data existed on the use of NICU RRT resources at the start of this project. The needs assessment revealed the perception by staff and leaders that the use of NICU RRT resources was high. Part of this project's purpose was to quantify the use of NICU RRT resources to establish actual use and to establish a baseline for comparison. The Data Collection Chart Audit report was created with the IT EPIC team for this project to collect accurate and valid data. Initial baseline data revealed that NICU RRT resources are used in about 50% of all deliveries and 30% for the subset of vaginal and term newborn deliveries. Historical charted data (See Appendix M) will be part of the education to staff.

Practice Scenarios

The curriculum from the NRP program and hospital policies guided the integration of the checklist format on the NRP algorithm and practice scenarios. Practice scenarios will be used to

elicit staff engagement during the education intervention. The scenarios were created by experts in the science of neonatal resuscitation science and will be adopted directly from the NRP curriculum (Weiner & Zaichkin, 2021; Wyckoff & Weiner, 2021; Wyckoff et al., 2020).

Plan for Data Collection

The chart review will include all deliveries within the data collection timeframe. Inclusion and exclusion criteria will be applied to identify the final population of all newborns ≥ 36 weeks and vaginal delivery. The chart review tool is mapped to collect patient ID, method of delivery, gestational age, indication for induction if applicable, L&D complications if any, amniotic fluid color, Apgar score at one and five minutes, resuscitation interventions, the timing of skin-to-skin initiation, and whether NICU RRT resources were called for delivery (see Appendix H).

The timing of data collection is a two-step process. First, the project lead will complete a chart review during June, August, September, and November 2022 (see Appendix H). The data elements mapped from the Delivery Summary have not been collected or analyzed previously and will be used to establish facts vs. perceptions of the use of NICU RRT resources. The preliminary findings of using NICU RRT resources and correctly completing required charted elements will be shared with the administration and staff during the education session (see Appendix M).

These same data elements mapped from the Delivery Summary to the chart review tool (see Appendix H) will be collected and analyzed to determine the use of NICU RRT resources before and after the education seminar. The data collected during the chart review will be completed four weeks before the intervention in February 2023 and then for four weeks post-intervention in March 2023. Process evaluation will occur during the weekly chart review analysis post-intervention.

Access to data on the organization's computer is password protected. Reports are created after permission is granted by Information Security Services. Data and the chart review report are collected and stored within the organization's EMR system. The aggregate chart review report will be downloaded into an Excel document for coding (see Appendix I). The project lead will use the patient ID only if charted elements are missing from the data download to complete a manual chart review from the correct Delivery Summary. After data has been cleaned and coded, the project lead will remove the patient ID column. The Excel document, without patient identifiers, will be downloaded into SPSS software for statistical analysis. No data with identification measures will be stored on any devices or outside the security of the password-protected computers and EMR.

Participants in the study, the L&D RNs, attend the quarterly mandatory staff meetings. Those unable to participate watch a recording of the session. The management team will provide the total number of attendees. No other data will be collected on nurses.

Plan for Analysis

The statistical tests planned for this project are exploratory and descriptive to describe a phenomenon from the identified population sample. The project aim is to determine if the use of NICU RRT resources will decrease by 10% after an educational session. The statistical test will be a simple frequency percentage comparison of NICU RRT resources present for term newborns delivered vaginally. The L&D RNs providing care to newborns will be the same before and after an intervention.

Tables, charts, and line graphs will be used to describe, and trend charted elements in the delivery summary of newborns born via vaginal delivery, term $\geq$36 weeks' gestation, and if NICU RRT resources were present. The statistical analysis will compare the number of NICU RRT

teams present for vaginal deliveries of $\geq$ 36 weeks' gestation newborns to the total number of vaginal deliveries of $\geq$ 36 weeks' gestation newborns.

The number of nurses attending the education session will be documented to track that all nurses included in the study received the intervention. However, no demographic data will be collected as the nurses are an aggregate of L&D RNs with active NRP Provider status. Knowledge tests will not be completed as staff have already proved competency during their NRP provider course.

Ethics/Human Subjects Protection

The project leader registered the project with the Department of Research at Touro University and completed the DNP Project Team Determination form. The project was approved as a quality improvement (QI) project (see Appendix N). The project leader completed CITI training to ensure human subjects protection. The Research Council at the project site provides oversight for all research on campus, determines the level of IRB approval needed, and oversees QI projects with outcome measures. The project leader submitted the project and required documentation to the Council and completed the requested changes. The Research Council granted final approval as a QI project (see Appendix O).

The direct population of interest is the Registered Nurses (RNs) who attend deliveries in the Maternity Pavilion. No identifying or demographic information will be collected on individual nurses. The nurses will be viewed as an aggregate of current L&D RNs with active NRP provider status. The staff's ongoing benefit is attending meetings and education offerings during their regularly scheduled mandatory training requirements. The nurses will receive regular compensation for attending their meetings, including the project's education intervention. There is

minimal to no risk to staff as a review of documentation during the pre- and post-intervention chart audits is within the scope and knowledge of job expectations.

The indirect population of interest is the newborns at least 36 weeks' gestation delivered vaginally on the Maternity Pavilion. Identification of newborns will only be retained in the first step of the chart review. If data is missing from the IT EPIC data download, then a manual chart review will be completed. All identifying information will be removed before downloading to the SPSS software for further analysis. Therefore, no identifying or demographic information will be reported on individual newborns or mothers. The deliveries will be viewed as a cohort of newborns delivered in the survey month. The newborns will not be manipulated or treated differently due to their involvement in this project.

Analysis of Results

The overarching question for this project was whether educating nurses on the evidence-based NRP Essential Provider program guidelines and hospital policies increased adherence to the NRP algorithm and decreased the use of NICU RRT resources.

The initial intent of this descriptive percentage statistic was to quantify baseline use of NICU resources in all deliveries. Baseline data revealed an average of 54% deliveries, ranging from 49.3% to 59.4%, used NICU resources in four months prior to the implementation of the DNP project. Figure 2 compares NICU resources used in pre-intervention and post-intervention deliveries. Simple frequency percentages reveal the use of NICU resources for all deliveries decreased to 50.7% post intervention compared to 52.3% during the four weeks prior to the intervention and compared to the average of 54% in historical baseline data.

Figure 2

NICU RRT Resources Used in All Deliveries

Method of Delivery All Deliveries
NICU Present

	June	August	October	November		February pre data	March post data
NICU present	51.20%	49.30%	59.40%	56.30%		52.30%	50.70%
vaginal	227	253	220	232		197	187
c/s	109	105	142	116		101	97
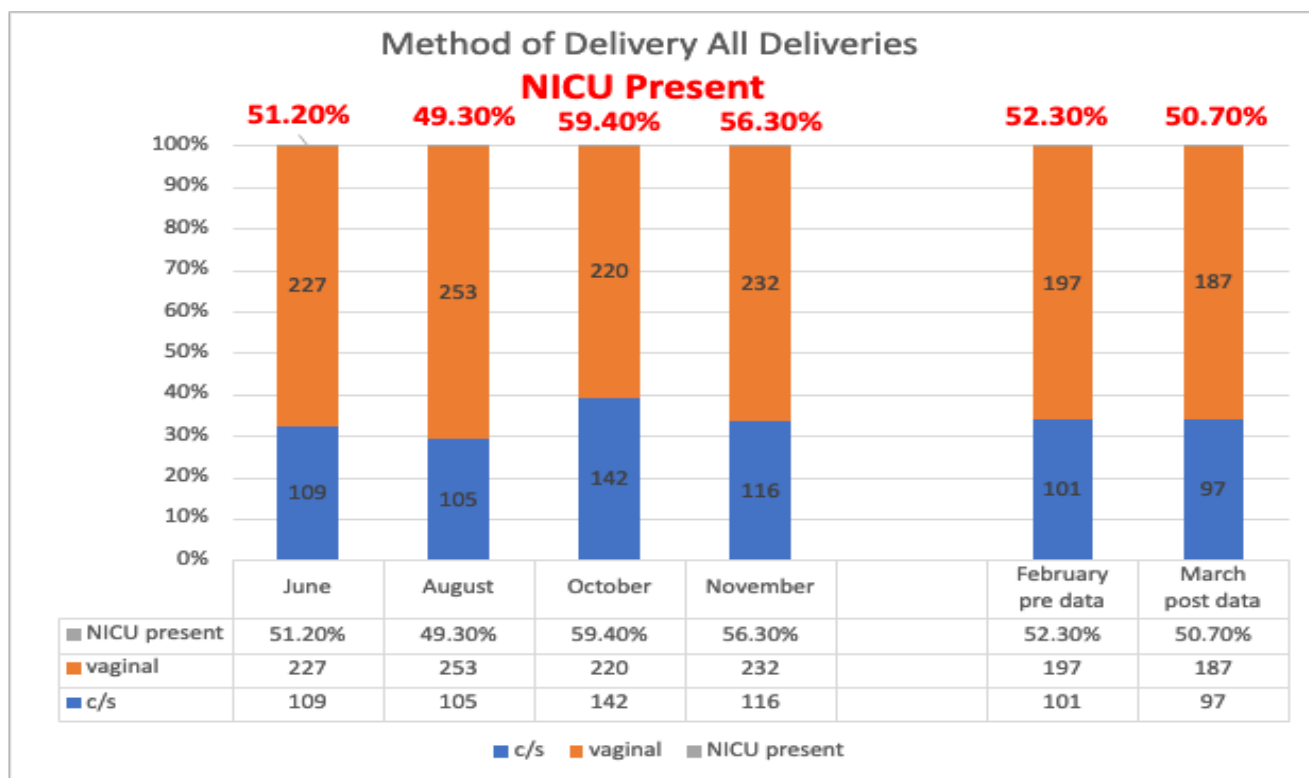
NICU RRT Resources in Term Vaginal Deliveries

This project aimed to decrease NICU RRT resources in the delivery room by 10%, as evidenced by chart review from the EHR and L&D RNs' documentation in the newborn delivery record over four weeks. Figure 3 compares the use of NICU RRT resources for term ($\geq$36 weeks) and vaginal deliveries for the pre-intervention and post-intervention deliveries, as well as historical baseline data results. Figure 3 shows historical baseline data found to range from 25.9% to 31% of term vaginal deliveries with NICU RRT resources used. The post-intervention deliveries had fifty-one deliveries where NICU was present and 124 when NICU was not called, resulting in 29.10% of the term vaginal deliveries needing NICU RRT resources. In comparison, the term vaginal deliveries during the four weeks before the intervention had a NICU RRT resources use of 33.9%, with sixty-one deliveries needing NICU RRT resources and 119 deliveries that did not use NICU RRT resources.

Figure 3

NICU RRT Resources Used in Term (≥36 weeks) Vaginal Deliveries

	June	August	October	November		February pre data	March post data	
■ NICU present %	25.90%	30%	31%	30.20%		33.90%	29.10%	
■ NICU not Present	157	161	136	148		119	124	
■ NICU Present	55	72	61	64		61	51	
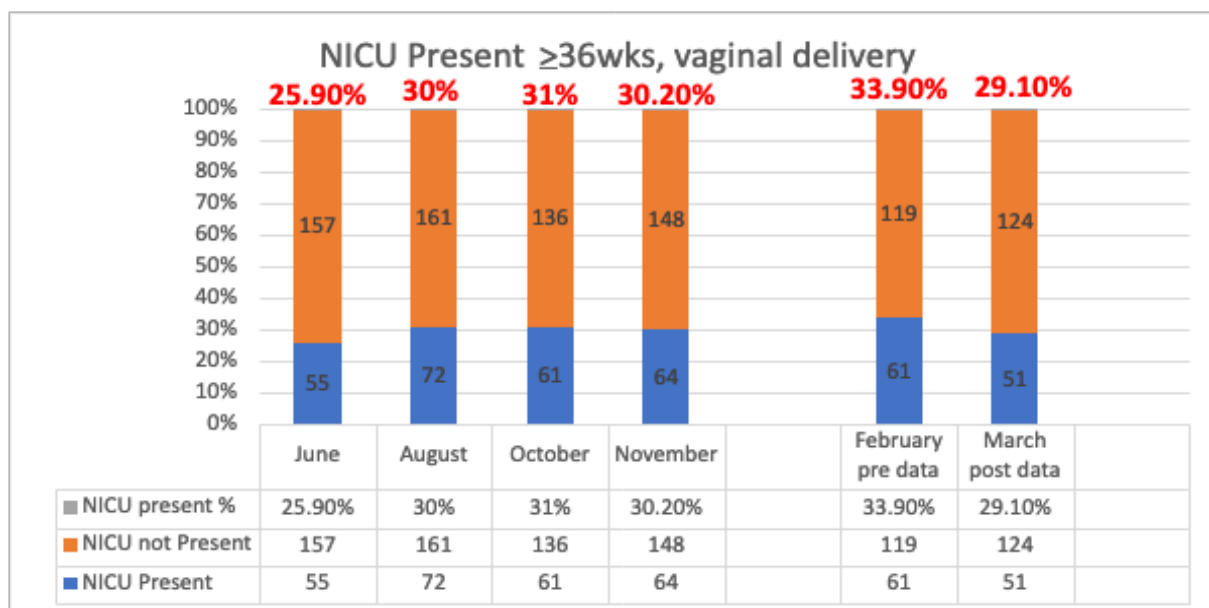
Neonatal Risk Factors and Adherence to NRP Process

The main objective of this project was to evaluate the L&D RNs' adherence to the NRP process and hospital policies, measured via pre & post review of interventions and use of NICU resources in the EHR report, and chart review of the newborn delivery record. Figure 4 describes the occurrence rates of neonatal identified risks that necessitate NICU RRT resources to attend the delivery, charting of those elements and whether the NRP process was adhered to for term (≥36 weeks), vaginal delivery, and if NICU RRT resources were used.

The chart review revealed aggregate descriptive data summarized as simple frequency rates of risk factors that NICU must be present and include vacuum use, shoulder dystocia, chorioamnionitis, premature prolonged rupture of membranes (PPROM), fetal abnormalities, category III fetal heart strip, presence of meconium, and missed charting. The chart review also revealed data elements of newborn transfer to the Infant Resuscitation Room (IRR)/NICU, an RRT called after delivery due to the newborn ability to transition and determined if the nurse

failed to adhere to the NRP process or policies before calling for NICU RRT attendance. Figure 4 reflects the difference in the data of deliveries four weeks before the intervention to the four weeks after the education and months when baseline data were collected.

In the post-intervention group, the risk factors not documented in the Delivery Summary decreased from thirty-nine to twenty-seven charts. The missing description of amniotic fluid to capture meconium presence decreased from nine to five in the post-intervention group. The number of NICU RRTs called after delivery period and during transition increased to twelve from five in the post-intervention group. The number of deliveries considered non-adherent to the NRP process and policies decreased from seven to three in the post-intervention group.

Figure 4

Risk Factors Identified and Adherence to NRP Term ($\geq$36 weeks) Vaginal Deliveries, and NICU RRT Resources Used

	Vacuum	Shoulder Dystocia	Chorio/ Sepsis	PPROM PROM	Fetal abnormality or heart rhythm	Cat III fetal strip	Meconium	missing Fluid color charting	identified risks not documented	to IRR/NICU	RRT called after delivery	non adherent to NRP/policy
■ June	15	4	2	2	6	0	8	7				
■ August	16	5	13	3	17	2	15	5	36	13	5	10
■ October	8	3	7	1	10	3	6	6	39	13	18	7
■ November	17	4	5	3	5	0	10	7	36	10	3	10
■												
■ Feb pre data	11	7	8	3	4	1	14	9	39	6	5	7
■ March post data	15	4	5	5	5	4	12	5	27	5	12	3

Summary and Interpretation of Results

The project's first aim to collect baseline, pre-intervention, and post-intervention data using NICU RRT resources by chart review from the electronic health records (EHR) and L&D

RNs' documentation in the newborn delivery record was met. The project's second aim was carried out by providing an educational seminar for the L&D RNs. The third aim of this project, to decrease the use of NICU RRT resources in the delivery room by 10%, as evidenced by the chart review over a four-week period, was partially met.

NICU RRT Use for Term (≥36 weeks) Vaginal Deliveries

While there was a 4.8% decrease in the use of NICU RRT resources in the four weeks following the educational session, the results did not reflect the outcome goal of a 10% decrease in the reliance on NICU RRT resources in the delivery room. The review of chart documentation reveals that the L&D RNs currently identify prenatal and fetal risk factors and call for NICU resources per hospital policy. Adjusting the policy on when to call NICU would lead to a continued decrease in NICU calls for deliveries. For example, when analyzing the post data in Figure 3, the L&D RNs called NICU for fifteen vacuum deliveries, five chorio/sepsis placed on risk algorithm, and twelve with simple meconium present. These deliveries accounted for thirty-two out of the fifty-one deliveries that NICU attended. Removing these risk factors would result in NICU RRT resources only being called to nineteen of the 175-term vaginal deliveries. This policy change could lead to needing to call NICU at a rate closer to 11% versus 30%. This percentage is more closely aligned with the AAP NRP stating that 10% of newborns need help transitioning and may require more resources (Bettinger et al., 2021; Weiner & Zaichkin, 2021; Wyckoff & Weiner, 2021; Wyckoff et al., 2020).

NICU /RRT Use for Overall Deliveries

The baseline data average revealed NICU was present at an average of 54% of all deliveries. The trend before and after the education intervention shows a continued decrease in NICU RRT resources for all deliveries. This is partly due to the decreased use of NICU in term

vaginal deliveries and a change in NICU attendance at scheduled low-risk repeat cesarean sections (C/S). NICU RRT resources were historically called for all C/Ss; however, beginning in February, during the pre-data collection period, the policy changed to have L&D RNs start to attend the low-risk scheduled C/S.

Findings Linked to Objectives and Literature

The overarching question for this project was whether educating nurses on the evidenced-based NRP Essential Provider program guidelines and hospital policies increased adherence to the NRP algorithm and decreased the use of NICU RRT resources. There were three objectives for this project.

Objective One

The first objective to identify and provide resources for L&D RNs to ensure safe and efficient care for all newborns in the delivery room was met. The ILCOR guidelines and Part 6: Resuscitation Education Science (Cheng et al., 2020) recommend that institutions consider adopting deliberate practice and mastery learning model during resuscitation training, offering booster training, and implementing learning opportunities to improve skill acquisition and retention for many critical tasks. The administration approved the project with a focus on collecting data on deliveries and the use of NICU RRT resources, education on course content from the NRP curriculum, and adoption of a checklist NRP algorithm.

Objective Two

The second objective to develop and execute education sessions to review hospital policies, the NRP Essential Provider standards of care, the NRP algorithm in a checklist format, and the collection of preliminary historical data was met. The Quality Improvement chapter of the 8th edition NRP course (Lee, 2021; Weiner & Zaichkin, 2021; Weiner & Zaichkin, 2022)

encourages using checklists and visual aids, such as the NRP algorithm, during resuscitation training to promote skill acquisition and retention. A checklist format aligned with the NRP algorithm was introduced during the education session. Hospital policies and documentation requirements were reviewed and clarified. The tool used to review charts was created and used to collect baseline, pre-intervention, and post-intervention data. The education was received by 89% of the staff with the remaining staff members required by management to review the recording of the session.

Objective Three

The third objective to evaluate the L&D RNs' adherence to the NRP process and hospital policies, measured via pre & post-review of interventions and NICU resources in the EHR report, and chart review of the newborn delivery record was met. The Quality Improvement chapter of the 8th edition NRP course (Lee, 2021; Weiner & Zaichkin, 2021; Weiner & Zaichkin, 2022) reviewed the need for more data collection within PDSA cycles to improve the care of newborns in the delivery room. Data collected in this first PDSA cycle revealed that the L&D RNs are consistent and accurate in identifying risk factors and calling NICU per the established hospital policies. The occurrence of non-adherence to the policies and following the NRP algorithm before the education session was already a low seven out of 298 (0.23%). It decreased further after the education session, with only three deliveries out of 284 (0.1%) not following the policy to call NICU or the NRP process! The rate of missing charting of risk factors also trended down from an initial 21% to 15.4% after the education session.

Impact on people and systems

The impact on the staff and the established system of calling for NICU RRT resources was clear while developing the project with the project site. A chart review of historical and current

charted data closed the perceived gaps of inconsistent adherence to NRP standardized guidelines on readiness, rapid assessment, and ventilatory support for newborns in the delivery room. An education session reviewed hospital policy, and the NRP algorithm provided a review of content to support L&D RNs' confidence levels in providing transitional care in the delivery room.

Hospital, physician, and nursing administration supported this project from the beginning. They soon expanded past the first goal to find resources to support the L&D RNs in the delivery room to decrease NICU presence in deliveries. As baseline data was collected and presented and the high rate of use of NICU across the department was acknowledged, a small test of change in policy to have L&D RNs attend scheduled low-risk cesarean sections was started.

Every staff meeting includes a section for newborn issues in delivery rooms presented by peer staff members. L&D RNs supported the emphasis on NRP policies, resource allocation, and looking at the system to decrease reliance on NICU RRT resources. Little to no resistance was met when working with L&D RNs for education, adoption of the NRP checklist algorithm, and presentation of data on their charting and use of NICU resources. The staff continues to ask for more education and simulation. The staff contacted the Magnet team to use this project to represent their department in the upcoming evaluation and site visit for re-accreditation. Of the hospital's Magnet designation.

The outreach to IT to help create the chart review tool has increased L&D RN staff and IT engagement. The outcome data revealed areas in the Delivery Summary EMR charting that can be improved to more accurately reflect the care provided to the newborn before, during, and after delivery.

Anticipated Outcomes vs. Unexpected Findings

A hopeful outcome during the SWOT analysis (see Appendix A) by the administration

was to develop a program for the L&D RNs to be Essential level NRP providers and to bring the skills sign-off and simulation on-site to work with their equipment and team versus staff attending different off-site courses. According to Lee (2021), structured data collection and analysis improve resuscitation processes and safe patient outcomes. Through the data collected and the measured outcomes, the administration can confidently support the development of the NRP program in the unit.

An unexpected finding was revealed in the historical data collection. The perception from administration and staff during the needs assessment was that before changing expectations or NRP provider levels, the skills and confidence of L&D nurses caring for the newborn in the delivery room and using NICU RRT resources should be reviewed. This perceived gap was inaccurate; the high rate of NICU attendance at deliveries is due to the L&D RNs' adherence to hospital policies and the NRP process and not due to their reliance on the NICU resources in caring for the newborn in the delivery room.

Costs and Strategic Trade-offs

The cost of NICU resources at deliveries is high both in dollars and personnel resources. Any delivery that does not call for NICU resources saves in salary and allows the RN, MD, and RT to remain in the NICU caring for their patients. However, the decreased use of NICU resources needs to be monitored to maintain the newborn's safety during delivery.

The cost to bring the NRP program to the L&D RNs comes with an outlay of costs as well as savings. The newborn mannequin costs $2,230 in addition to disposable costs for T-piece resuscitators, suction catheters, and supplies. Currently, staff attend off-site NRP courses that cost $250 for each nurse. The NRP online didactic costs $45 for each nurse. The increase in skills, teamwork, and simulation opportunities will improve patient safety, and these savings are

immeasurable for the patient, the staff, and the hospital system.

Limitations

The accuracy and effectiveness of this data analysis heavily relied on the quality of charted information. While staff demonstrated improvements in documenting risk factors, certain deficiencies were identified during the chart review process. Notably, there were no designated locations to record specific risks, such as instances where the newborn faced difficulties transitioning after the L&D RN followed NRP measures or when the OB requested the presence of the NICU team during delivery. The resuscitation section of the Delivery Summary only allowed for limited radio button documentation, needing more capacity for detailed descriptors that explain the necessity of NICU attendance during the delivery. Furthermore, the charting options available to L&D RNs did not align with the NRP algorithm and failed to include interventions like CPAP.

The four-week timeline established for this project was too short to evaluate the full potential to decrease the NICU attendance rate. Additionally, the time constraints did not permit spacing out the education sessions or providing booster training as recommended by the ILCOR guidelines (Cheng et al., 2020). The scope of this PDSA cycle was narrow in that the plan was to offer one intervention education session. However, immediately following this intervention, the L&D staff asked for more booster training and peer-partnering at deliveries to support their confidence in providing interventions to the newborn. The project leader responded by providing more one to one training, debriefing after deliveries, and attending staff meetings to practice skills and answer questions. Concurrently, based on the historical data collected during this project, the Maternity Pavilion educators started to review resources for the L&D RNs and identify interventions to further minimize the need for NICU calls during deliveries. One example was the

policy that guided NICU attendance at all cesarean section was adjusted to allow L&D nurses to attend low risk scheduled cesarean section without calling for NICU resources. These initiatives and increased support by the project leader in the delivery room occurred during the project which further complicated the evaluation process of the project's intervention.

Conclusion

In conclusion, the ILCOR Formula for Survival (see Figure 1), which encompasses guidelines based on resuscitation science, effective education of providers, and timely resuscitation implementation, is crucial for achieving optimal resuscitation outcomes (Cheng et al., 2020). The initial needs assessment revealed a misperception regarding the confidence of L&D RNs in delivering care following standardized approaches using the NRP algorithm. However, a review of the collected data made it evident that the high rate of NICU attendance at deliveries resulted from the L&D RNs' adherence to hospital policies and the NRP process rather than a reliance on NICU resources.

To enhance skill acquisition and retention for critical tasks, Donoghue et al. (2021) recommend incorporating deliberate practice and mastery learning models, providing booster training, and implementing spaced learning opportunities during resuscitation training. In response, the intervention for this project offered resources and time for skill practice and reviewed opportunities to improve charting. The L&D RNs' immediate response to the intervention and seeing the historical data led to multiple requests for more training and peer support in the delivery room. As the post-data revealed their adherence to policies and the NRP algorithm, additional requests were received to offer more booster training as well as overwhelming support to bring the NRP Essential level course to their unit.

It is important to note that while the NRP course equips staff with the knowledge and

skills to become competent NRP providers, the responsibility for maintaining continuing competence in newborn care lies with the institution and its staff. Allowing Essential level NRP Provider status for staff through a policy change can further strengthen the confidence of the L&D staff. Arabani & Salah (2016) found that self-confidence is critical to effective clinical performance and directly impacts competence. The data collected and measured outcomes from this project, together with the overwhelming positive responses by the L&D RNs, provides a strong foundation for the administration to confidently support the development of the NRP program in the Maternity Pavilion.

It is recommended to initiate the next PDSA (Plan-Do-Study-Act) cycle to develop and offer the NRP course while continuing data collection to monitor progress. Additionally, developing and offering in-situ simulations can enhance real-life scenario-based learning. To support these initiatives and further study the elements outlined in the Quality Improvement chapter of the 8th edition NRP course, the hospital, medical and nursing leadership have agreed to support the project leader in sustaining the efforts to ensure safe and efficient care of newborns in the delivery room. The policy has been changed to allow for NRP Essential level provider status, and the project leader is working with administration to develop the NRP course for the staff on the Maternity Pavilion.

Plans to disseminate the project and outcomes have been outlined. The first dissemination of this project has occurred with hospital administration and resulted in their support to continue quality improvement initiatives in the delivery room and offering the NRP course on the Maternity Pavilion. The second will be to submit this project to the Doctor of Nursing practice project repository. A poster and abstract will be submitted to Sigma Theta Tau Research Conference and the LLU Research Day for podium or poster presentation. Longer term plans will

be to work with AAP NRP to contribute to resuscitation science and quality improvement initiatives.

By implementing these recommendations and continuing to prioritize quality improvement, the project site is incorporating ILCOR strategies to increase survival and improve outcomes (Cheng et al., 2020). With the available resources, time, and support, the staff on the Maternity Pavilion have the confidence to provide timely, safe, and efficient care to newborns in the delivery room and embrace the ability to continually improve outcomes.

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Appendix A

SWOT Analysis

Best Practices	Best Practice Strategies	How do project site practices differ from best practices?	Barriers to best practice implementation
NRP Essential or Advanced Provider	allow for tailor level to role	currently accepts Advanced	Time for admin to allow new levels
Essential Provider RN to focus on ventilation skills and when to call for help	RN to suction, CPAP, PPV	-set up T piece, trained for PPV -calls for help often	• training • confidence • competence
Simulation and skills sign off	-in situ -standardized -in house NRP instructors	off-site variability in offering simulation and skills practice	-time to develop program -in house NRP instructors
NRP program	use of algorithm	-inconsistent -stop early before calling for help	-Easy to call NICU RRT
Collect data on QI measurements	QI activities in the delivery room per NRP	New focus so various focus at other institutions	-Develop measures -who will do -maintain and sustain efforts
Intermittent simulation, education, or training of newborn resuscitation skills	Provide simulation or re-training every 3 months	Limited offerings	-need simulation equipment -need NRP instructors -educator time -staff budget
Charting of Resuscitative measure	Complete and accurate documentation	Perception is not complete, no IT reports to complete chart audit	IT creating report to allow for chart audit
Trained, experienced L&D RNs who provide excellent care to high-risk patients		Meet	n/a
Staff are NRP certified		Meet	n/a
Asses perinatal risks and prepare	Use risk factor list in NRP	Not listed in policy, inconsistent application of when to call Fetal RRT	-posted list -education
Perform equipment check	Use checklist	Not listed in policy, inconsistent application of readiness	-posted list -education
Gather correct team & brief	Risk factors agreed upon for what team needed at delivery	Not listed in policy, inconsistent application of when to call Newborn RRT	Uncertainty on when to call NICU for different risk factors
Rapid evaluation of newborn		Meet	n/a
Delay cord clamp		Meet	n/a
Warm, dry, stim newborn		Meet	n/a

Initial steps		Meet	n/a
Mother staying with mom/skin to skin		Meet	n/a
Initial steps at radiant warmer	Warm, dry, stim. Position airway, suction mouth, and nose	Calls NICU RRT if newborn shows s/s of needing help transitioning	-re-inforce education -confidence -competence
Begin PPV	Initiate PPV if apnea/gasping or if HR <100	Calls NICU RRT if newborn shows s/s of needing help transitioning	-re-inforce education -confidence -competence
Ventilation Corrective steps	MR SOPA	Calls NICU RRT if newborn shows s/s of needing help transitioning	-re-inforce education -confidence -competence
Free-flow oxygen	30% blowby if no resp distress but O2 sats not in range	Calls NICU RRT if newborn shows s/s of needing help transitioning	-re-inforce education -confidence -competence
CPAP	Labored breathing or persistent cyanosis Set 20/5 @21% Offer 30 seconds	Calls NICU RRT if newborn shows s/s of needing help transitioning	-re-inforce education -confidence -competence

Appendix B

Reference Search Results

2020 references from NRP program/ guideline	initial search	second review
Take home message	22	4
Anticipation of resuscitation needs	16	3
~~Umbilical cord mgmt.~~	~~41~~	~~0~~
Initial actions at birth-temp, warm/dry/stim, clear airway	23	4
~~Heart rate~~	~~21~~	~~0~~
Vent support/PPV/CPAP	37	3
Oxygen	5	3
~~Chest compression~~	~~13~~	~~0~~
~~Intravascular access~~	~~8~~	~~0~~
~~Medications~~	~~8~~	~~0~~
~~Volume Replacement~~	~~8~~	~~0~~
~~Post-resuscitation care~~	~~20~~	~~0~~
~~Withholding care~~	~~7~~	~~0~~
Human system performance/ training frequency	12	4
Brief/debrief	12	2
TOTAL	**202**	**23**

Final Reference List	Initial search	Second review
NRP course	20	5
NRP science	4	0
NRP QI	14	10
Algorithm, visual, checklist	4	3
Compliance, adherence, competent	20	13
Confidence, self-efficacy	9	6
Educate, teach, re-teach	31	12
Simulation	12	4
General	15	8
TOTAL	**129**	**60**

Appendix C

NRP Algorithm

Antenatal counseling.
Team briefing.
Equipment check.

Birth

Term gestation? Good tone? Breathing or crying? — Yes → Stay with mother for initial steps, routine care, ongoing evaluation.

No

A Warm, dry, stimulate, position airway, suction if needed.

Apnea or gasping? HR <100 bpm? — No → **Labored breathing or persistent cyanosis?**

Yes (down) / Yes (down for labored breathing)

B PPV. Pulse oximeter. Consider cardiac monitor.

Position airway, suction if needed. Pulse oximeter. Oxygen if needed. Consider CPAP.

HR <100 bpm? — No →

Yes

Ensure adequate ventilation. Consider ETT or laryngeal mask. Cardiac monitor.

Post-resuscitation care. Team debriefing.

HR <60 bpm? — No

Yes

C ETT or laryngeal mask. Chest compressions. Coordinate with PPV-100% oxygen. UVC.

HR <60 bpm? — No

Yes

D IV epinephrine every 3-5 minutes. If HR remains <60 bpm, • Consider hypovolemia. • Consider pneumothorax.

1 minute

Target Oxygen Saturation Table	
1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%

Initial oxygen concentration for PPV	
˜ 35 weeks' GA	21% oxygen
<35 weeks' GA	21%-30% oxygen

Appendix D

Plan-Do-Study-Act

https://www.apiweb.org/

https://encrypted-
tbn0.gstatic.com/images?q=tbn:ANd9GcRL07N9V0lMFqqawfEuQFrCTA2fijrpS
T7kgQ&usqp=CAU
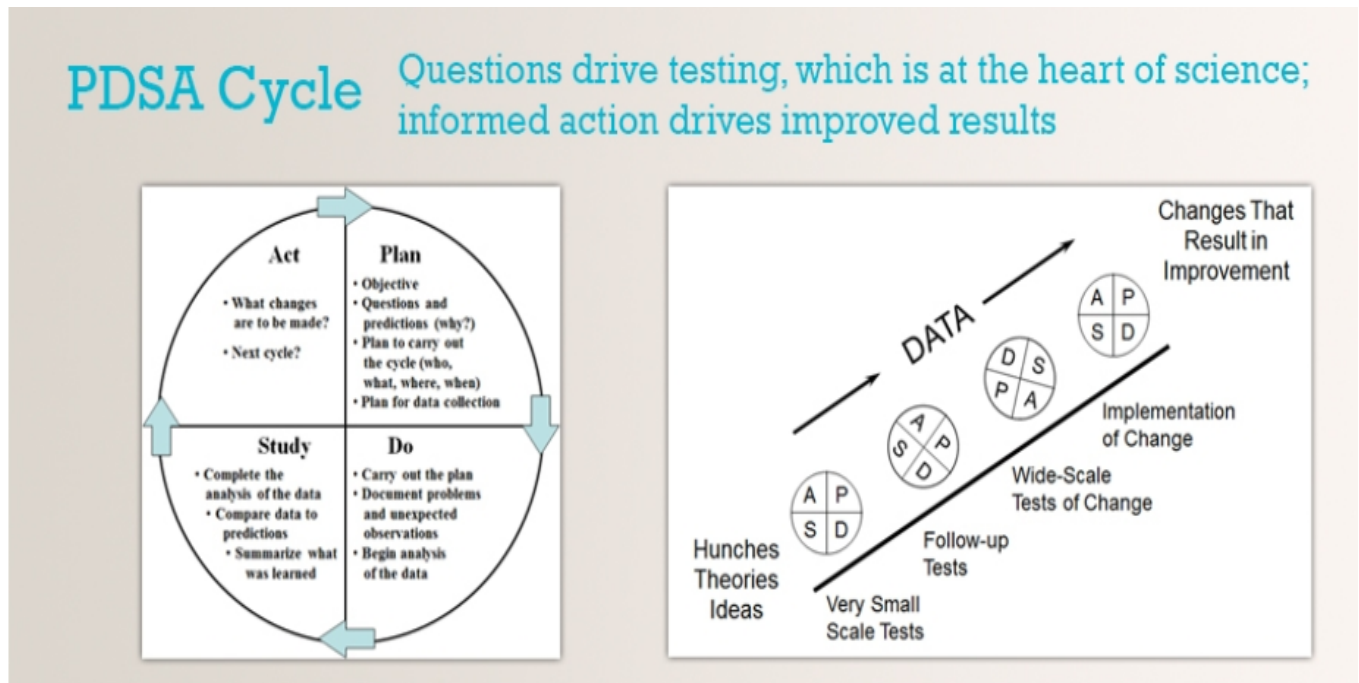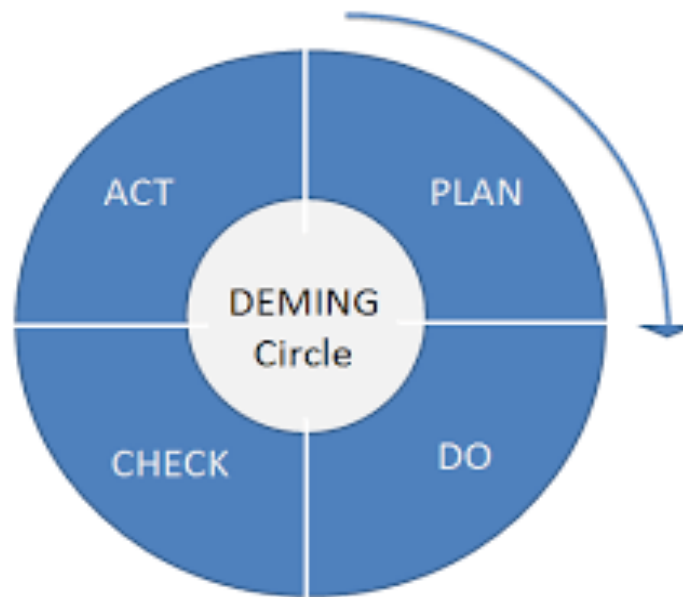
Appendix E

Project Permission

< **Touro Univ, NV;...** ∧ ∨

On Jul 15, 2022, at 12:49 PM, Radovich, Patti <PRadovich@llu.edu> wrote:

Good Morning Ghinette,

After communicating with Kim Johns I believe we can support MaryJo's project.
Please move forward with clearance.
Once we have clearance MaryJo I would like to meet to discuss you projects logistics and approval requirements.
Thank you
Warm Regards,
Patti

Take care, stay safe

LOMA LINDA UNIVERSITY CHILDREN'S HOSPITAL   MAGNET RECOGNIZED AMERICAN NURSES CREDENTIALING CENTER   LOMA LINDA UNIVERSITY MEDICAL CENTER
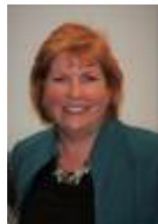
Patti Radovich, PhD, CNS, FCCM (she, her, hers) Director Nursing Research Loma Linda University Health Hospitals Email: _pr adovich@ llu.edu_

Appendix F

Affiliation Agreement

Affiliation Agreement Statement:

Touro University Nevada does not require affiliation agreements for DNP Practicum Experiences. However, the project/practicum site may require an affiliation agreement with Touro. Please delegate this form to an appropriate project/practice site representative for completion.
Please fill in the blanks below and check the appropriate box:
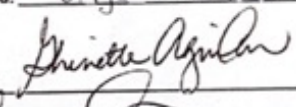
The TUN DNP student: MARYJo SCHAARSCHMIDT is authorized to complete practicum hours at the above listed project site.
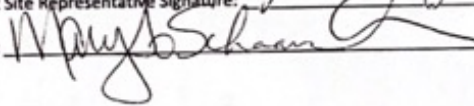
_____ An affiliation agreement is required for completion of this practicum experience.

___X___ An affiliation agreement is not required for completion of this practicum experience.

*If an affiliation agreement is required, please insert the name and contact information of the person who will coordinate the agreement:

Name of representative: Ghinette Aguilar, MSN, FNP

Contact Information and preferred contact method: MANAGER of ACADEMIC Affairs GAguilar . llu. edu

Authorized Project Site Representative Signature: _____

Student Signature: _____ 7/25/2022

Appendix G

Timeline

date	Trimester I	11/2-8	11/9-29	11/30-12/5	12/6-12	12/13-19	12/20-1/2	1/3-8	1/9-15	1/16-29	1/30-2/26	2/27-3/4	3/5-31	4/1-6/1
week		1	2-4	5	6	7	8	9	10	11-12	13-15	1	2-5	6-16
~Title, Problem, Question	▓													
~Search Methods, Study Methods, Lit Review,Theme Development	▓													
~Aims, Objectives, PDSA Model	▓													
~Identify LLUCH Policies	▓													
~Review NRP 8th Edition	▓													
~Identify resources for L&D RNs					▓	▓	▓							
~Create NRP algorithm checklist	▓													
~Obtain Permission for Project Site	▓													
~Obtain permission to access data	▓													
~Develop data collection tool w IT	▓													
~Population, Setting, Stakeholders		▓												
~Collect & analayze prelim data for education			▓	▓										
~Develop intervention				▓	▓	▓								
~Develop plan				▓	▓	▓								
~Complete IRB & CITI modules					▓	▓	▓							
~Develop & present for Research Council approval							▓	▒	▒					
~Meet Eds & Dir to approve final plan for intervention								▒	▒					
~Secure support & resources								▒	▒					
~Implement action plan											▒	▒	▒	▒
~Collect pre- data											▒			
~Provide intervention											▒	▒		
~Collect post-data												▒	▒	
~Analyze data														▒
~Report results to stakeholders														▒
~Disseminate findings														▒

Appendix H

Data Chart Audit Tool

**ID	GA	Del Method	Apgar 1	Apgar 5	Resuscitation	NICU	S2S	No S2S	Induction	L&D Complications	Fluid Color
1234	3	1	8	9	1	1		3			1
2345	3	1	6	8	2	1		1	5	4	1
3456	3	1	8	8	2	1		1	5		1
4567	3	1	6	9	2	1		1	5		2
5678	3	1	5	7	2	1		1	2		1
6789	3	1	5	8	4	1		1	2		1

ID	GA	Delivery Method	NICU
ID#	exclude <36 weeks	exclude c/s	RRT called y/n
0246	33	c/s	y
1234	31	vaginal	n
7891	39	vaginal	n
1357	40.2	c/s	y

Indications for Induction if any	L&D Complications if any	Meconium if any
PROM, PPROM	shoulder	y/n
fetal anomaly	chorioamnionitis	
FHR stress	FHR distress	
severe pre-eclampsia		

Apgar 1	Apgar 5	Resuscitation	Skin to Skin Delay
number	number	level	time to mom
6	8	none	immediate
8	8	suction	or delay
6	9	oxygen	
5	7	PPV	
5	8	code	

Data Collection Tool

Identify ≥36wks, Vaginal Delivery, NICU RRT
- ❑ The patient ID# is needed if further chart review is needed if data is missing in download of data.
  **Will be deleted after chart audit complete
- ❑ Gestational Age and Delivery Method are needed to provide exclusive criteria.
- ❑ NICU RRT called is needed as key outcome.

Identify Risk Factors to Call NICU
- ❑ Indications for Induction, if any
- ❑ L&D Complications, if any
- ❑ Meconium, if present

Charted Descriptive Elements
- ❑ Apgar Scores at 1 min and 5 min
- ❑ Resuscitation Interventions
- ❑ Timing to mother

Appendix I

Data Collection Code Book

Item	Variable Code	Response Code
Patient ID	**ID**	**number**
Delivery Method	DEL	1=Vaginal Spontaneous 2=Vaginal Vacuum 3=cesarean section (c/s)
Gestational Age	GA	1= 35.6 ≤ weeks 2= ≥36 weeks
Indication for Induction	INDUCT	0= no response, none, n/a 1=PROM, PPROM 2=fetal abnormality, fetal heart rate/ rhythm abnormality 4=severe pre-eclampsia 5=elective, maternal indications
L&D Complications	Comp	0=no response, none, n/a 1=shoulder dystocia 2=chorioamnionitis 3=cat 3 FHR strip 4=maternal indications
Meconium	MEC	0=not charted 1=no, clear, bloody, other 2= yes, meconium
Apgar 1 min	APG1	0= 0 3=3 6=6 9=9 1=1 4=4 7=7 10=10 2=1 5=5 8=8
Apgar 5 min	APG5	0= 0 3=3 6=6 9=9 1=1 4=4 7=7 10=10 2=1 5=5 8=8
Resuscitation Intervention	Resus	0= not charted 1=none 2= suction 3= +oxygen 4= +PPV 5= + intubation and/or CPR
Skin to Skin Initiated	S2S	0=not charted 1=immediate-2 mins 2=delay <15 mins 3=delay 15-30 mins 4=>30mins 5=to IRR, NICU
NICU RRT Called?	NICU	0=no, not called 1=yes, called

Appendix J

Policy for Calling RRT Resources for Education Intervention

LOMA LINDA UNIVERSITY
CHILDREN'S HOSPITAL

Criteria for Calling OB/Neonatal/Fetal
Rapid Response Team

1. Criteria for calling the Obstetrics Rapid Response Team
    1.1   Obstetric hemorrhage
    1.2   Eclamptic seizure
    1.3   Ruptured ectopic pregnancy
    1.4   Sepsis
    1.5   Complication from epidural/spinal placement (ex. high spinal)
    1.6   Other clinical concerns by the obstetrics or OB Anesthesia Team

2. Criteria for calling the Neonatal Rapid Response Team
    2.1   Evidence of and/or concern for neonatal respiratory distress (ex. grunting, retractions, oxygen desaturation)
    2.2   Seizures without other symptoms
    2.3   Other clinical concerns by the obstetrics team

3. Criteria for calling the Fetal Rapid Response Team
    3.1   Complicated meconium (ex. Category 2 FHT and meconium)
    3.2   Chorioamnionitis
    3.3   Operative vaginal delivery
    3.4   Elective and urgent cesarean section delivery
    3.5   Shoulder dystocia
    3.6   Prematurity (30-35 weeks gestation)
        3.6.1 Fetal Code White for prematurity (viability-29w6d gestation)
    3.7   Known non-life threatening fetal anomalies (ex. spinabifida, gastroschesis)
        3.7.1 Fetal Code White for known life threatening fetal anomalies (ex. diaphragmatic hernia).
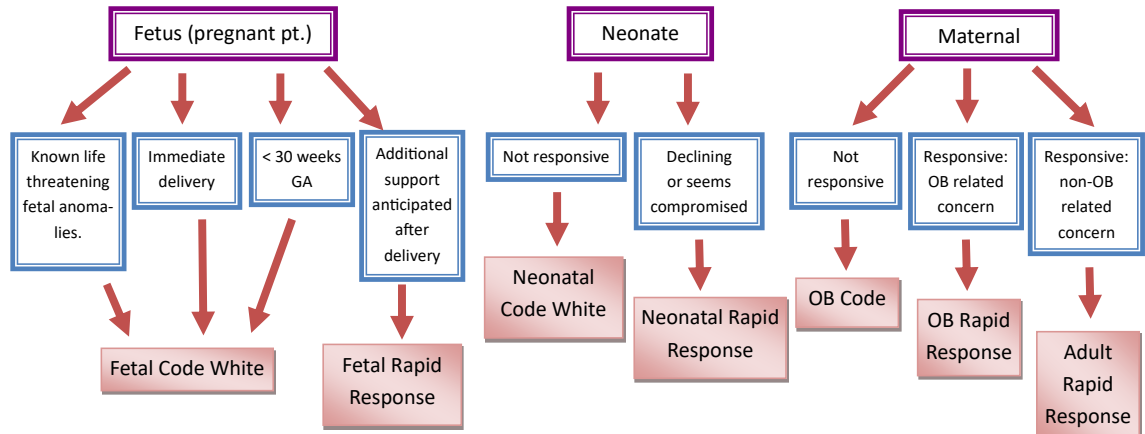   3.8   Other clinical concerns by the obstetrics team.

Approved: CH PSRC 2/11/21, CH MSEC 7/26/21

Appendix J

Policy Calling RRT Algorithm for Education Intervention

LOMA LINDA UNIVERSITY
CHILDREN'S HOSPITAL

Code Activation Algorithm

* For use in Maternity Services and NICU only.

Fetus (pregnant pt.)

- Known life threatening fetal anoma-lies.
- Immediate delivery
- < 30 weeks GA
- Additional support anticipated after delivery

Fetal Code White

Fetal Rapid Response

Neonate

- Not responsive
- Declining or seems compromised

Neonatal Code White

Neonatal Rapid Response

Maternal

- Not responsive
- Responsive: OB related concern
- Responsive: non-OB related concern

OB Code

OB Rapid Response

Adult Rapid Response

*If there is more than one code/RRT that you could call, the higher acuity takes precedence.

Ex. Gastroschesis is a Fetal Rapid Response, 28 weeks is a Fetal Code White. If you have a 28 week delivery with gastroschesis you will call a Fetal Code White. The fetal Code White takes precedence over the Fetal Rapid Response.

*Any non-pregnant people who are __not__ patients (ex. visitors), call a Code Blue (postpartum patients remain an OB Code)

For more detailed information, please refer to the Mom/Baby Code Chart and the Criteria for Calling Rapid Response.
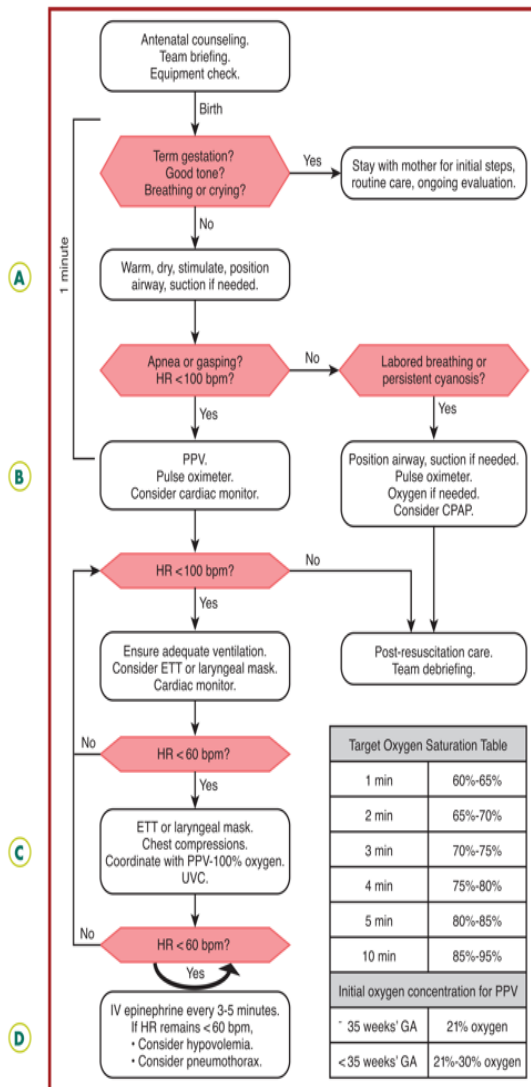
Approved: CH PSRC 6/10/21, CH MSEC 6/21/2021

Appendix K

Checklist Format NRP Algorithm for Education Intervention

NRP Algorithm
Checklist

Gestational Age:_____wks
Risk Factors:_____

Birth Date:_____
Birth Time:_____

A= Airway
B= Breathing
C= Circulation
D=Drugs

Anticipation and Preparing/Readiness
- ☐ Radiant warmer on
- ☐ 4 baby blankets open on warmer
- ☐ Hat and diaper on top of blankets
- ☐ stethoscope
- ☐ NeoPuff set (25/5 and FiO2 21%, flow 8-10)
- ☐ Suction set 80-100mmHg
- ☐ Pulse ox and probe, tape
- ☐ Mini bag with suction tubing & catheters, masks
- ☐ Resuscitation tray in room

Perinatal Risk Factors Identified
- ☐ call Fetal RRT/Code prior to baby born
- ☐ call Neonatal RRT/Code after baby born

Initial Steps of Newborn Care
- ☐ Rapid eval: baby to mother or warmer?
- ☐ **Warm, dry, stimulate**: newborn ventilating?
- ☐ **Suction** mouth then nose: if needed
  - ☐ Heart Rate >100 w cyanosis/patent airway/ breathing: give **free flow oxygen** at 30%, titrate to O2 sat table- if unresolved call Neo RRT ☐
  - ☐ Heart Rate >100 with labored breathing/grunting: **CPAP** @5, O2 at 21%, titrate to O2 sat table- if unresolved call Neo RRT ☐
  - ☐ Heart Rate <100: continue with stimulation and ensure patent airway: **PPV** @ 21%, titrate to O2 sat table- if unresolved call Neo Code White ☐
  - ☐ Apnea or Gasping? continue with stimulation and ensure patent airway: **PPV** NeoPuff @ 21%, Rate 40-60bpm, titrate to O2 sat table- if unresolved call Neo Code White ☐
  - ☐ HR <60 after 30 seconds of effective ventilation, initiate chest compression, call Neo Code White ☐
  - ☐ Any other concerns, call Neonatal RRT or Code as indicated ☐

Document
- ☐ in Delivery Summary Resuscitation section
- ☐ in newborn chart as needed

Appendix L

Charting Elements for Education Intervention

Indications for induction ⚠		
☐ Elective		☐ Hypertension
☐ Severe Preeclampsia		☐ Post-term Gestation
☐ Multiple Gestation		☐ Fetal Abnormality
☐ Fetal Heart Rate or Rhythm Abnormality		☐ Premature ROM
☐ Prolonged ROM		☐ Fetal Demise
☐ Mild Preeclampsia		

Complications

Complications?   No   **Yes**

Labor Complications	
☐ Abruptio Placenta	☐ Arrest of Descent
☐ Arrest of Dilation	☐ Category III Fetal Strip
☐ Chorioamnionitis	☐ Hemorrhage
☐ Placental Attachment Disorder	☐ Shoulder Dystocia
☐ Uterine Rupture	☐ 3rd/4th Degree Laceration

Forceps attempted?   Yes   **No**

Vacuum Details

Vacuum extractor attempted?   **Yes**   No

Indications   Arrest of Descent | Maternal Contraindication to Pushing | Maternal Fatigue
Non-Reassuring Fetal Heart Rate

Vacuum application location   Low   **Mid**   Outlet

First attempt time vacuum applied   06:24 AM

Number of pop offs   1

Total vacuum application time   1   Minutes

Vacuum applied by

Failed?   Yes   **No**

Fetal Heart Rate

Mode	🔍 📄	FSE
Doppler/Fetoscope Rate		155 BPM
Baseline Rate		145 bpm
Baseline Classification		110-160 bpm
Variability		6-25 BPM
⤢Pattern		A; Recurrent; LD
Late Deceleration Nadir		120 bpm
Late Deceleration Duration (sec)		40
Prolonged Deceleration Nadir		70 bpm
Prolonged Deceleration Duration (mins)		2
Pattern Observations		Time of birth
FHR Category		Category II
⤢Multiple birth?		

Membranes

Rupture Labor Identifier		Sac 1
⤢Membrane Status		Artificial
Rupture Date		12/20/2022
Rupture Time		0103
⤢Amniotic Fluid Color/Characteristics		Clear
Odor		None
Amount		
Confirmed by		

Membrane Status - Read Only

Rupture Labor Identifier Sac 1 Sac 2 Sac 3 Sac 4 Sac 5

Rupture date/time 12/20/2022 0103 ↱ Edit in Flowsheets

Rupture type Spontaneous Artificial Prolonged (18 hours) Premature Preterm Premature

Amniotic fluid color/characteristics Clear Bloody Meconium Yellow Pink Brown Polyhydramnios Oligohydramnios None

Resuscitation

NICU:	NICU Called	NICU Present

Method: None | Suctioning | Oxygen | PPV | Intubation | Chest compressions | Umbilical catheter | Epinephrine
Naloxone | Surfactant | Volume expansion | Bicarb | Other

Suctioning Method bulb syringe | catheter | DeLee | endotracheal | gastric | intubation | NG catheter

✔ Close   ✖ Cancel   ⬆ Previous   ⬇ Next

Newborn I/O | **Newborn Vitals** | Newborn Nursery Assess | Neonatal Screening | NICU Daily Cares/Safety | NICU Vitals ▼

Search: Newborn Vitals

○ Accordion ○ Expanded ● View All

1/3/23 1202

O2 Device

1m 5m 10m 15m 30m 1h **2h** 4h 8h 24h   Interval Start: 0700 | Reset | Now

Select single option (F5)

	Admission (Current) from 1/3/...	Last Filed
	1/3/2023	
Search (Alt+Comma)	**1202**	
Height and Weight		
Type of Scale		Infant
Pain Assessment		
Pain Assessment		N-PASS
Pain Intervention(s)		
Level of Sedation		
Level of Sedation		1
Pain - N-PASS (Neonatal Pain, Agitation and Sedation)		
Premature Pain Assessment		0
Pain - Crying/Irritability		0
Pain - Behavior State		0
Pain - Facial Expression		0
Pain - Extremities Tone		0
Pain - Vital Signs		0
N-PASS Score		0
Oxygen Therapy		
SpO2: Pre-Ductal		
O2 Device		None (Room air)
O2 Percent		25 %
Pulse Oximetry Type		Continuous
SpO2 Alarm Limit High		
SpO2 Alarm Limit Low		
Oximetry Probe Site Chang...		
O2 Sat Location		Right foot
Pain Screening		
Response to Interventions		

O2 Device options:
None (Room air)
Nasal Cannula (eg.RAM)
High flow nasal cannula
Simple mask
Total Face Mask (e.g., Helmet)
High Flow Oxygen Mask (e.g., OxyMask)
Aerosol mask
CPAP
BiPAP
Trach mask
Face tent
Non-rebreathing mask
Partial rebreathing mask
Ventilator
NIPPV
T-Piece
Venturi mask
Blow-by
O2 conserving device (eg. Oxymizer)
Bag-Valve Mask
Other (Comment)

Comments (Alt+M)

📄 **Skin to Skin** ✏

Skin to skin initiation date/time	12/20/2022	0625
Skin to skin with	Mother	Father	Other Family Member
Skin to skin end date/time	12/20/2022	0735
Nutrition plans (check all that apply)	✔ Breastfeeding	☐ Formula feeding	☐ Donor's milk
Milk expression in first hour?	Yes No	
Breastfeeding initiated in first hour?	Yes No	

Appendix M

Historic Preliminary Chart Audit Data for Education Intervention

Example of Preliminary Data on NICU Resources
Used in Education Materials

Method of Delivery All Deliveries
NICU Present

	June	August	October	November	December
NICU present	51.20%	49.30%	59.40%	56.30%	
vaginal	227	253	220	232	
c/s	109	105	142	116	

c/s vaginal NICU present

NICU Present ≥36wks, vaginal delivery

	June	August	October	November	December
NICU present %	25.90%	30%	31%	30.20%	
NICU not Present	157	161	136	148	
NICU Present	55	72	61	64	
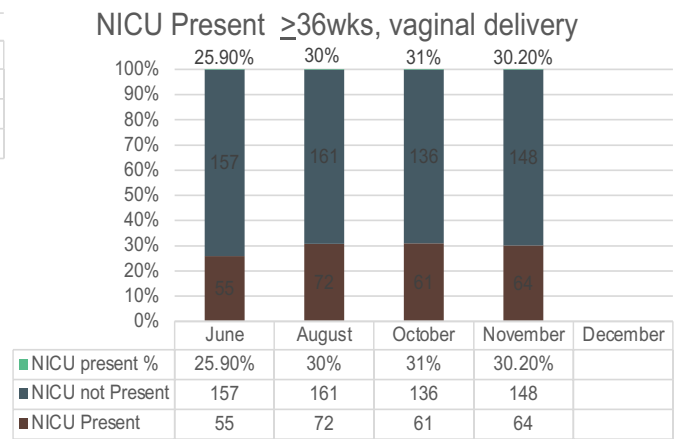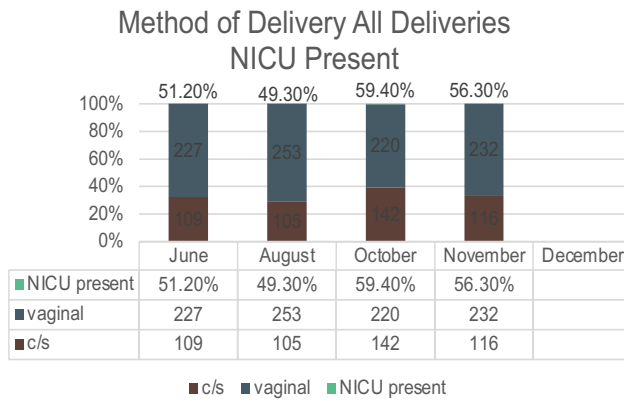
Appendix N

DNP Project Team Determination Form

DNP 763–Project II

DNP Project Team Determination: Quality Improvement Project or Research

All DNP Projects, regardless of methodology, must uphold the highest standards of ethical practice including confidentiality and privacy as described in the ANA Code of Ethics. Accordingly, basic principles of ethics, confidentiality, and privacy must be addressed and maintained in each phase of the DNP Project implementation. Methods for maintaining such should be described in full detail within body of the DNP Project Paper.

If the determination is made that the DNP Project is a "Quality Improvement Project," then the project should be referred to as such in all future communications–both written and verbally. Quality Improvement projects should not be referred to as research or research projects and are not subject to any form of IRB review. Additionally, the student should not make any claims in writing or verbally of IRB exemption status, acceptance, or review in such projects.

Sections A and B should be completed and submitted by <u>the student</u>. **Section C** should be completed by <u>the faculty</u>.

SECTION A

Student Name: __MaryJo Schaarschmidt_____

DNP Project Title: __ Adherence to NRP Guidelines: A Quality Improvement Initiative

DNP Project Instructor: __ Dr. Tracey Johnson-Glover_____

DNP Project Mentor: _Dr. Nancy Brashear_____

Quality Improvement or Research Worksheet

Rachel Nosowsky, Esq.

ITEM	Issue and Guidance	Rating
1	Are participants randomized into different intervention groups to enhance confidence in differences that might be obscured by nonrandom selection? Randomization done to achieve equitable allocation of a scarce resource need not be considered and would not result in a "yes" here.	____ YES __X__ NO
2	Does the project seek to test issues that are beyond current science and experience, such as new treatments (i.e., is there much controversy about whether the intervention will be beneficial to actual patients – or is it designed simply to move existing evidence into practice?). If the project is performed to implement existing knowledge to improve care – rather than to develop new knowledge – answer "no".	____ YES __X__ NO

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3	Are there any potential conflicts of interest (financial or otherwise) among any researchers involved in the project? If so, please attach a description of such in an attachment to this form.	____ YES __X__ NO
4	Is the protocol fixed with a fixed goal, methodology, population, and time period? If frequent adjustments are made in the intervention, the measurement, and even the goal over time as experience accumulates, the answer is more likely "no."	____ YES _X___ NO
5	Will data collection occur in stages with an effort to remove potential bias? If so, is there any potential for data skewing from this process?	____ YES __X__ NO
6	Is the project funded by an outside organization with a commercial interest in the use of the results? If the answer to this question is "Yes" please also answer question 6a and 6b. If the project is funded by third-party payors through clinical reimbursement incentives, or through internal clinical/operations funds vs. research funds, the answer to this question is more likely to be "no."	____ YES __X__ NO
	6a Is the sponsor a manufacturer with an interest in the outcome of the project relevant to its products?	____ YES _X__ NO
	6b Is it a non-profit foundation that typically funds research, or internal research accounts?	____ YES __X__ NO

Adapted from Hastings Center, "The Ethics of Using Quality Improvement Methods to Improve Health Care Quality and Safety" (June 2006) If the weight of the answers tends toward "yes" overall, the project should be considered "research" and approved by an IRB prior to implementation. If the weight of the answers tends toward "no," the project is not "research" and is not subject to IRB oversight unless local institutional policies differ. Answering "yes" to sequence #1 or #2 – even if all other answers are "no" – typically will result in a finding that the project constitutes research. It is important to consult with your local IRB if you are unsure how they would handle a particular case, as the analysis of the above issues cannot always be entirely objective and IRB policies and approaches vary significantly.

Obtained from: Quality Improvement or Research Worksheet

SECTION B

All projects, including student QI or EBP projects, are required to be registered with the Department of Research at TUN. Please register your project via this Qualtrics survey. Provide your information as the PI for your project.

__X_ Yes, I registered my project with the Department of Research at TUN via the link above

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___ No, I did not register my project with the Department of Research at TUN. Please provide rationale.

 SECTION C

Project Classification Decision:

The project instructor will select one of the three classifications listed below.

__X___ This DNP Project is a quality improvement project. Do not submit to IRB for review.

_____ This DNP Project contains research methodology, and an IRB application should be submitted to the TUN IRB committee for exemption determination and/or full IRB review.

_____ This DNP Project is not clearly delineated as quality improvement or research of discovery. Additional consultation will be obtained from the IRB committee by the project team. The advice of the IRB committee regarding the need for review will be noted in writing and the student will be informed of such (Please attach any pertinent documentation from IRB review as an Appendix to this document.)

By signing below, the project instructor indicates that they agree with the above selection.

Printed Name of Project Instructor: _____ Dr. Tracey Johnson-Glover _____

Electronic Signature of Project Instructor: __*Dr. Tracey Johnson-Glover*___

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Appendix O

Research Council QI Project Approval

January 20, 2023

To: Mary Jo Schaarschmidt

Dear Mary Jo:

On behalf of the Nursing Evidence-based Practice and Nursing Research Council at Loma Linda University Health Hospitals, we have approved your research study entitled, **"Adherence to NRP Guidelines: A Quality Improvement Initiative"**. We feel that this is a very interesting project that will greatly improve our nurses understanding of and resuscitation experience.   We will be very interested in the study results as you complete the project.

You may proceed at this time with data collection with in the LLUCH Labor & Delivery setting. Upon completion of your study NRC requests that you complete the attached research report, present a summary of your findings to the council and to Patti Radovich, PhD at pradovich@llu.edu.

Good luck with your project. If we can be of any further assistance, please contact me.

Sincerely,

Patti Radovich

Patti Radovich, RN, PhD, CNS, FCCM
Chair, Nursing Research Council
Director Nursing Research
Telephone: 909-558-3923
Pager 8343
Email: pradovich@llu.edu