Spring 5-15-2017

Safe Sleep in the NICU Environment for SIDS Prevention

Renee J. Aumua
University of San Francisco, neejaumua@att.net

Safe Sleep in the NICU Environment for SIDS Prevention

Renee J. Aumua, RNC

University of San Francisco

School of Nursing and Health Professions

Safe Sleep in the NICU Environment for SIDS Prevention

Clinical Leadership Theme

The theme of my project is *safety* which utilizes the CNL curriculum essential: *Translating and Integrating Scholarship into Practice* and the CNL competency: *Lead change initiatives to decrease or eliminate discrepancies between actual practices and identified standards of care*. Functioning in the CNL role of Risk Anticipator, I aim to assess and improve the safety of the sleep environment of our NICU population.

Statement of the Problem

Sudden Infant Death Syndrome(SIDS) is defined as a cause of infant death that remains unexplained after a thorough case investigation, including a scene investigation, autopsy, and review of the clinical history (American Academy of Pediatrics (AAP), 2011). It remains a leading cause of infant mortality under one year of age. Since 1994, placing infants in a supine sleep position for every sleep until one year of life has been a priority risk-reduction for SIDS. For about ten years the NICU population was exempted from this recommendation due to medical status and environment. Then in 2011 the AAP released new recommendations for safe sleep and SIDS prevention which lowered the infant postmenstrual age for supine positioning and, for the first time, directly addressed healthcare providers in the NICU.

Despite this update, a common opinion of NICU staff is that SIDS risk reduction strategies aren't a priority for our patient population. It is not uncommon to see our NICU patients being placed in non-supine sleep positions like prone or side-lying close to discharge. In a bed audit I conducted, I found 33% of qualified infants in our NICU being incorrectly slept in a non-supine position (Appendix A).

In addition, I discovered discrepancies within our unit's SIDS prevention policy. This included allowing for exemptions to supine positioning that aren't supported by the AAP. The purpose of this project is to ensure a safe sleep environment for our NICU patients by following the recommended AAP SIDS prevention guidelines. This will ensure a safer sleep environment for our patients even after discharge home, when they are most at risk for SIDS.

Project Overview & Methodology

The site for this project is a 550 bed community hospital in Northern California. It is a Magnet Recognized hospital. The Magnet Program is assigned and monitored by the American Nurses Credentialing Center (ANCC). It recognizes health care organizations that demonstrate excellence and adherence to national standards for the organization and delivery of nursing services. In the last few years the organization has partnered with large, teaching institutions with a goal of expanding the women's and children's services department.

My project's focus is the microsystem of the 35 bed Neonatal Intensive Care Unit (NICU). Most of the rooms are single patient, with two larger rooms equipped to accommodate twins. The majority of patients are born onsite and admit to the NICU for prematurity, respiratory distress syndrome, rule-out sepsis/infection or hypoglycemia. There are some transports in from neighboring hospitals due to acuity, as this is one of two local Level III NICUs in the county.

The main healthcare team on this unit consists of neonatologists, pediatricians, registered nurses, lactation consultants, social work, and respiratory therapists. We are also supported by child life specialists, speech therapists, nutrition, pharmacy and secretarial staff. The leadership team consists of two co-medical directors(neonatologists), a department director, unit manager, clinical nurse specialist(CNS), and three unit supervisors- one for each shift. The average daily census is 19 with a range of patient acuity leading to patient ratios of 1:1 to 1:4. We have a core

staffing of 10 RNs per shift which allows for eight assignments, one charge and one resource nurse.

Interdisciplinary rounds are held weekly, with a larger one held monthly, to collaborate on patient care and processes. There is a departmental Family Centered Care(FCC) Committee with nursing representatives from each unit in Women's and Children's Services, child life specialists, social work, physician, CNS, and family advisors. The FCC committee works to address areas of improvement for informing and integrating families into care decisions. Ensuring that they feel a part of the healthcare team. The NICU is also supported by a unit council that is run by registered nurse representatives from each shift. They evaluate and strive to improve care policies and programs in the NICU.

With the Safe Sleep project, we aim to improve the NICU RNs' knowledge that supine positioning is safer for our patients starting at 32 weeks gestation or postmenstrual age, by 10% by May 10th. We will achieve this by updating the unit policy per the 2011 AAP guidelines for SIDS prevention, educating staff through an on-line education module, and by providing a one-hour literature seminar where the evidence can be reviewed and discussed.

As stated in the global aim statement, our main objective is to ensure a safe sleep environment for our NICU patients by following the recommended AAP SIDS prevention guidelines. Our unit policy on SIDS prevention was reviewed. The review was conducted by nursing and neonatology at our monthly interdisciplinary meeting. During this review the goal was to update and align the guidelines for supine positioning and eliminate exemptions that are not supported by the AAP for the NICU environment.

The global aim statement anticipates an RN knowledge deficit. The bed audit of our patients' sleep positioning supports this. To assess this further, a pre-survey was given to staff to

determine their baseline knowledge and understanding of supine positioning for SIDS risk-reduction, as it pertains to our NICU population. The survey was also an attempt to understand what barriers may be preventing proper patient positioning.

The next step was presenting the updated unit policy on SIDS prevention at the NICU staff meeting. A one-hour literature review seminar was held immediately afterward. During the seminar a Safe Sleep power point presentation was shown to allow for further review of the updates, to present supportive evidence, and to address specific barriers to RN support of the AAP recommendations. The seminar allowed for dialogue between the bedside RNs, the CNS and the CNL student. Copies of two of the main research articles were made available for staff to keep. In addition, the power point presentation will be edited and transitioned into a mandatory online education module for all NICU RNs, with an anticipated completion date of April 30th.

The CNS, CNL student and leadership team felt that presenting the education in various formats like this, would increase retention for staff. To assess the improvement of RN understanding I will re-survey the NICU RNs with the same survey used in pre-implementation. I will be looking for an improvement in awareness of our unit's SIDS prevention policy, and understanding of the safety of supine positioning for our patients in the NICU.

The change theory utilized for this project was Everett Rogers' five characteristics of spreadable innovations. The Institute for Healthcare Improvement (IHI) (2017), lists the five as relative advantage, simplicity, compatibility, trainability and observability. When viewing the project through these characteristics, simplicity and observability are the strongest. I can say that supine positioning is definitely easy to learn and use. It is also easy to observe quickly in practice. Use of this theory emphasized to me that relative advantage is a weak point that needs focus. Supine positioning is very clearly better than what's in place, but the *perception* that it is

better is the true obstacle. The project scorecard using this change theory can be seen in Appendix B.

Rationale

A strengths, weaknesses, opportunities and threats(SWOT) analysis of the NICU was done (Appendix C). King & Gerard (2013) define a SWOT analysis as a way to help identify factors that may affect a project positively and negatively. It is considered vital for the successful planning and implementation of change in a microsystem. My analysis identified established strengths in the unit such as an innovative atmosphere and staff that are accustomed to quality improvement. It also identified weaknesses such as competing priorities of SIDS risk reduction vs. developmental care at the bedside. Overall, the positive strengths and opportunities outweighed the negative weaknesses and threats. This provided a favorable outlook for the project.

The staff pre-assessment survey was done to determine their baseline perceptions, barriers and common practices in regards to supine positioning in the NICU (Appendix D). We had a good response rate of 63%. The results revealed a 32% belief by the NICU RNs that it is acceptable practice to place our patients in non-supine positions while telling parents not to do it at home. Another 27% mistakenly believe that our patients are at a higher risk for aspiration when supine and only 59% expressed knowledge of our current unit policy for SIDS prevention.

A root cause analysis (RCA) (Appendix E), showed that the NICU population itself, lends to confusion and inconsistencies in care. In their article, Barsman, Dowling, Damao, & Czeck (2015) describe the dilemma of competing priorities of SIDS risk-reduction recommendations with the principles of developmental care for the NICU population, which are often contradictory to one another. Our RCA also showed that RN beliefs affect compliance

when they differ with SIDS guidelines. Skill level poses barriers for both the novice and proficient RN for varying reasons. And lastly, the current unit policy is not aligned with the latest AAP guidelines, leading to noncompliance with supine positioning in the unit.

The costs associated with the Safe Sleep project include paid time for the literature review seminar. It is one hour of paid time for all who attend. On average about twenty RNs in attendance with a base rate pay of $85/hr. = $1700. However, this review is held quarterly so it is an item that is already built into the annual budget for the unit. My time worked on the project includes the time in Family Centered Care Committee meetings which is two hours/month. Again, not an additional expense. The other hours were part of my clinical immersion time. We are requiring staff to complete the online education module which may take ten to fifteen minutes. Staff are required to complete these things during their regular shifts so it is not an additional expense. For the most part, the entire project is budget neutral.

Determining a monetary savings resulting from the project is challenging. The outcomes are increased patient safety and potentially a decrease in infant mortality. After a lengthy literature search on the topic of financial impact of infant mortality, I discovered there is very little information in this area. I found only one existing article. Fox, Cacciatore, & Lacasse (2014) conducted a study to estimate the economic costs during the first six months after the death of an infant in the U.S. They concluded the average costs to be about $21,332 per household. The bulk of costs are associated with loss of productivity associated with parental grief.

Timeline

The timeline for this project began in November 2016 and will conclude in May 2017 (Appendix F). To inititate this project, we understood that we needed to get a baseline of RN opinions and practices in our unit. In November 2016, our CNS helped me devleop an RN survey to gather this information. In December 2016, our CNS outlined the project to our RN Unit Council. It is standard protocol in our unit that practice changes are reviewed and approved through this council. This maintains shared governance for our nurses. In January 2017, after we received the approval, we conducted the survey. We used the month of February 2017 to tally the results and compare our unit policy with the 2011 AAP guidelines for SIDS prevention. We were then able to take the survey results, showing the need for the project, and the proposed policy changes to our NICU committee for approval from our medical directors and nursing leaders. In March 2017 we created the education materials and presented them to staff at a non-mandatory meeting. I conducted a literature review seminar and we released the new, updated SIDS prevention policy at this time. We also conducted a bed audit, which supported the need for the project. The SIDS power point was submitted to the education department. Unfortunately, we met with delays and weren't able to get a final online education module launched to staff until the last week of April. This was originally our anticipated date of completion for staff. During this delay our CNS emailed the draft presentation to staff in the hopes that it would help to educate staff, however there was no way to track it or make it required. We finally got the module launched on April 25th. This has pushed back our collection of new data to assess outcomes of the project.

Literature Review

Performing a literature review using the keywords SIDS, NICU, prematurity and nurse resulted in many articles with strong evidence to support supine positioning and the importance of nurse's role-modeling this guideline while the infant is in the hospital. The evidence also supports the importance of SIDS prevention. The American Academy of Pediatrics (2011) explains how supine positioning actually protects the infant's airway from aspiration. That this position should not be exempt for infants with reflux and they include the premature, and ill infant in these guidelines. They are no longer considered exempt due to this population's increased risk of SIDS. The task force also specifically calls for NICU staff to model and implement all SIDS risk reduction recommendations as soon as the infant is clinically stable and significantly before anticipated discharge. These recommendations support the objective of my project, which is to update the unit policy to these standards and educate the RNs to these changes.

Matthews & Moore, (2013) recount the history of SIDS and the prevention campaigns driven by the AAP. The triple-risk model is where it is believed that SIDS results from the intersection of three overlapping factors: underlying vulnerability of the infant, a critical developmental period in homeostatic control and exogenous stressors. They note that altering the sleep environment reduces the modifiable risk factor in the triple-threat hypothesis. They also cite a previous study done in 2006, where 95% of 252 neonatal nurses identified non-supine positioning as best for hospitalized preterm infants. This supports my project's plan to focus on the supine positioning in the NICU as a model behavior for parents.

Gelfer, Cameron, Masters, & Kennedy (2013) stated that very low birth weight infants are more likely to sleep in the nonsupine position after discharge. They conducted a random

audit of a level II NICU that showed only 39% of infants were sleeping in the supine position. The authors developed an algorithm to standardize when to transition a NICU patient from developmental positioning to supine only, an education module for nurses and parents and a post discharge telephone reminder. The program resulted in an increase to 83% NICU compliance with appropriately timed supine positioning. The post discharge telephone survey showed an increase of parent compliance with safe sleep practices to 82% after program implementation. This study supports my project's focus on having a clear policy for transitioning the NICU patient to a supine sleeping position. It also demonstrates the importance of RN role-modeling of safe sleep practices in the NICU for parent compliance post discharge.

Griffin, Heald, Davidson, & Kent (2016) conducted an audit of infant sleeping environments in a tertiary NICU and a general pediatric ward of an Australian hospital for compliance with safe sleeping guidelines. They audited 10 points of the safe sleep environment which included supine positioning. The study demonstrated that compliance within hospitals is likely to be significantly lower than expected which indicates a need for improvement in safe sleep practices in this setting. They also assert that supine positioning is considered the most critical factor in SIDS prevention.

Barsman et al. (2015) use a 33-item questionnaire to assess nurses' beliefs, knowledge and practice re: SIDS prevention. They highlight the categories of high-risk infants stating that newborns hospitalized for illness or prematurity (< 37 completed weeks gestation) fall into an even higher-risk category for sleep-related deaths. In addition, SIDS mortality rates are three times greater for infants born at 24 to 32 weeks gestation and more than two times greater for infants born at 33 to 36 weeks gestation. The results of their survey demonstrated 53% of neonatal nurses felt that risk-reduction recommendations made a difference in SIDS prevention.

But only 20% believe that parents would model nurses' SIDS prevention behaviors once home. In reality, the study found that just one-third of mothers placed their infants supine for sleep on discharge after witnessing prone sleep positioning during their infants NICU hospitalization These findings support my project and the need for more sleep safety education of NICU RNs.

Malloy (2013) reviewed information from the death records of infants who died suddenly in the U.S. between 2005- 2007. The adjusted odds ratio (OR) for post neonatal out-of-the-hospital deaths by gestational age were determined by logistic regression modeling. Over the 3-year period it was found that the adjusted OR for SIDS among the most preterm infants (24- 28 weeks) was significantly increased compared with term infants. It was determined that despite the drop in incident of SIDS since 1987, the risk for SIDS among preterm infants remains elevated. The findings highlight the increased risk for the population served in the NICU.

The link between role-modeling of safe sleep practices in the hospital setting and parent compliance post discharge is heavily supported. It has been found that parents will continue practices that they have witnessed, despite what they may have been taught to do. Bartlow, Cartwright, & Shefferly (2016) conducted an observational, quantitative and descriptive study of SIDS practice guidelines in newborn nurseries in two different hospitals. A convenience sample of direct observations was used to collect data on infants' positioning and crib environment. Nurses' knowledge and attitudes were measured using an anonymous, self-administered questionnaire. Despite nurses' self-reported knowledge of AAP recommendations, only 30.3% of infants observed fully met these guidelines. In addition, the authors refer to research showing that parents are most likely to practice SIDS prevention behavior when they are taught it in conjunction with seeing it modeled by nurses.

Moon, Hauck, & Colson (2016) state that staff practice is closely observed by parents and one study found that parents who reported seeing hospital personnel placing infants on the side were most likely to place their infants in the prone position. They also explored the barriers and motivations for changing behavior that led to compliance with the safe sleep environment. They cited quality improvement programs that effectively increased the compliance of staff and, through correct modeling, increased the compliance of parents post discharge. This supports the global aim of my project.

Patton, Stiltner, Wright, & Kautz (2015) conducted a literature review of studies conducted between 1999 and 2012 that were used to determine whether nurses provide a safe sleep environment for infants in the hospital setting. The authors concluded that infants continue to be placed in positions that increase the risk for SIDS. The review emphasizes that nurse compliance remains an issue needing improvement.

Expected Results

At the completion of the Safe Sleep in the NICU project I expect to have an updated unit policy that is fully aligned with the 2011 AAP guidelines for SIDS prevention. I am optimistic that we will have at least a 10% increase in RN knowledge and understanding of the policy. I would like to see the RN understanding of the safety of the supine sleep position for our patients increase as well. Currently 27% feel that it actually places our patients at a *higher risk* for aspiration. We need to significantly lower that number. The literature review seminar was attended by about 16 staff who appeared open to the evidence presented and expressed that the information helped to disprove long held beliefs. I feel strongly that if we can show strong evidence to the RNs that supports the benefit of change, then their increased understanding will lead to increased compliance and modeling for parents of SIDS risk-reduction practices. The

overriding outcome to this is a safer environment for our patients not only in the NICU, but also post discharge when they are at an increased risk.

Nursing Relevance

As the CNL, my role goes beyond just providing the education. It includes developing trust with the staff. This trust builds collaboration and understanding which leads to improved patient outcomes. Harris, Rousel, & Thomas (2014) assert that the CNL must incorporate research findings into practice to attain these outcomes. To achieve this, they must make practice research more transparent and promote organizational trust. It also involves identifying and resolving organizational barriers to implementation of this practice. Communication is key to identifying and resolving these barriers.

Summary Report

The main objectives of this project, to provide a safe sleep environment in the NICU in accordance with the AAP guidelines for SIDS prevention and to increase our NICU RNs' knowledge re: these guidelines and the safety of a supine sleep position for our patient population was an even larger task than I had anticipated. The pre-survey results demonstrated a larger knowledge deficit than I expected with only 59% of staff surveyed, aware of a supine sleep standard for SIDS prevention for our patients and 27% believing that supine sleep positioning put our patients at a greater risk for aspiration (Appendix D). RNs in our Mom/Baby Unit were surveyed at the same time by our Family Centered Care Committee and they demonstrated a much higher knowledge level in these areas compared to our NICU RNs.

During the literature discussion with staff, they appeared receptive to the new information on safe sleep standards for the NICU and the importance of what we role-model for parents. They had questions that we were able to answer, especially in regards to clarifying 'medically

stable' patients that would be expected to sleep in a supine position. For example, an infant on phototherapy, unable to be swaddled, may not be able to sustain a supine sleep position and could be exempted from the requirement during that time.

Prone positioning for sleep is the norm for the NICU due to developmental concerns in early gestations, as well as an improved digestion and respiratory effort in medically compromised and premature infants. These factors were discussed at length during the seminar. Research was presented that demonstrated a necessary point of medical status where these things were no longer factors and SIDS prevention becomes the priority.

The results of the bed audit done prior to implementation of the safe sleep interventions were not surprising. 33% of qualifying patients being placed in a non-supine sleep position was expected due to what can be seen around the unit. However, I expected more patients placed in a prone position by staff. In reality, every single patient captured in the audit as placed incorrectly, was in a side-lying position. Staff view side-lying as safer for patients who experience emesis and not as 'bad' as prone. In reality, this position is just as unsafe. Moon, Hauck & Colson (2016) state that staff practice is closely observed by parents and one study found that parents who reported seeing hospital personnel placing infants on the side were most likely to place their infants in the prone position.

The huge delay in our project was working with and waiting for the hospital nursing education department to convert the SIDS prevention power point to an online education module that we could then require all NICU RNs to complete. The education department services the entire organization which includes two hospital campuses. They have competing priorities to fulfill. In the past they have been able to convert education programs in as little as one week. In this case it took a full month. During this delay we presented the material to staff informally but

were not able to do so in a way that required staff to view it, or for us to track it's completion. A re-survey to assess RN knowledge on the topic of safe sleep in the NICU cannot be accurately determined until all education has been complete. The new due date for education completion of 5/1 allows the staff barely a week from the launching of the module. At this time a re-audit of patient beds was done which resulted in a drop from 33% of patients incorrectly positioned down to 23% incorrectly positioned.

Another challenge has been the increased acuity and census in the unit during this practicum. When staff are already working overtime and experiencing hectic shifts, they are not necessarily able to take the time to complete additional education. This was another reason why we needed to allow for the official module to be released as well as giving staff sufficient time to complete it. As a CNL, my role is to take this into consideration. If I want staff to be responsive and open to change and education, I have to consider the daily challenges they are facing.

Despite the lack of a re-survey at this time, it has been observed in charge RN report that the interventions have already made an impact on patient care. Several patients who appear at first glance to qualify for supine sleep positioning, have notes on their patient SBAR. These notes describe medical reasons for exemption. They also state that there is a doctor order for this exemption as required by the unit policy. This has rarely been done in the past. This demonstrates a commitment by the charge RNs to support and encourage use of the updated policy interventions with staff when receiving report. Charge RNs are accustomed to policy accountability being a part of their role in the unit. Once a re-survey of staff is done, we can assess where the need lies for further education and support.

This project will be sustained by the commitment of the CNS, and leadership in the unit. Random bed audits are being added to our NICU safety team's monthly audit list. At this time it

will focus on supine sleep positioning. Our safety team consists of a small number of RNs who conduct random safety audits every month in the unit. The results of the audits are posted on our quality board and reported out to all staff at monthly staff meetings. This is an established process.

In addition, our CNS, charge RNs and myself will need to monitor the charge RN patient SBAR sheets for comments re: medical exemptions and physician orders. We will need to ensure that the orders are appropriate and the exemptions necessary, as well as temporary. There is a potential for staff to obtain an order to exempt their patient from supine sleep positioning and then not follow through with discontinuing that order when appropriate, and as soon as medically stable.

Once supine sleep positioning has appropriately been established as a norm in the unit, we can move on to PDSA cycles of change re: the other factors of a safe sleep environment for our patients in accordance with the AAP guidelines. This will be followed and conducted by the Family Centered Care Committee. Our bed audit (Appendix A) already includes the other factors to help with data collection in preparation of future PDSA cycles. These factors include a flat bed vs. a raised head of the bed, items in the bed and blankets secured below the arms of the infant while sleeping. We started with supine sleep positioning because it is considered the most critical factor in SIDS prevention (Griffin, Heald, Davidson, & Kent, 2016).

Overall, I am pleased with the project. We may not have much to evaluate on at this time, but we have a solid foundation in place to advance patient safety in this area. It has taken more time than anticipated but I feel that we made sure to do things correctly and with a thoughtful process in mind. I have learned that the process is truly a key factor for improvement. I would like to thank my unit, my CNS and my manager who precepted me during this project. They not

only supported me, but were important resources for guidance and trouble shooting along the way. I am eager to see future outcomes continue from this project.

Abstract

Sudden Infant Death Syndrome(SIDS) remains a leading cause of death for infants less than one year of age. Historically, Neonatal Intensive Care units have been exempt from following SIDS safe sleep guidelines recommended by the American Academy of Pediatrics(AAP) for SIDS prevention due to patient medical status and environment. However, in 2011 these guidelines were updated by the AAP to include NICU specific recommendations. This is a very important change due to this patient population being at a higher risk for SIDS than the term, well newborn. The Safe Sleep project was conducted in a 35 bed, tertiary care NICU. The project's objectives were to align the safety of the sleep environment in the NICU with the updated SIDS prevention interventions and to address any RN knowledge deficits that may be present. Previous research has shown that this safe sleep environment established in the NICU will carry on through discharge home when the incidence of SIDS may occur.

Our focus for the project was on the supine sleep position being used for every sleep, as this has been identified as the most critical factor for SIDS prevention. A patient bed audit was completed which showed a 33% incorrect occurrence of non-supine sleeping. An RN survey to assess knowledge of SIDS prevention in the NICU and the perception of safety for supine sleeping was also completed which supported the existence of RN knowledge deficits. Education was completed in the form of an updated unit policy, a literature review seminar and a mandatory education module for all NICU RNs. A subsequent patient bed audit completed post education has shown a drop to 23% incorrect occurrence of non-supine sleep positioning. This is an improvement. It is recommended that we re-survey the RN staff 1 week post education completion to determine if a correction of knowledge was achieved. In addition future PDSA

cycles can be instituted with a focus on the other elements of a safe sleep environment for SIDS prevention.

References

American Academy of Pediatrics (AAP). (2011). SIDS and other sleep-related infant deaths: Expansion of recommendations for a safe infant sleeping environment. *Pediatrics, 128(5).* DOI: 10.1542/peds.2011-2284

Barsman, S., Dowling, D., Damato, E., & Czeck, P. (2015). Neonatal nurses' beliefs, knowledge, and practices in relation to Sudden Infant Death Syndrome risk-reduction recommendations. *Advances in Neonatal Care, 15(3), p.209-219.* DOI: 10.1097/ANC.0000000000000160

Bartlow, K., Cartwright, S. & Shefferly, E. (2016). Nurses' knowledge and adherence to sudden infant death syndrome prevention guidelines. *Pediatric Nursing 42(1).*

Fox, M., Caccciatore, J., & Lacasse, J. (2014). Child death in the United States: Productivity and the economic burden of parental grief. *Death Studies, p. 1-6.* DOI: 10.1080/07481187.2013.820230

Gelfer, P., Cameron, R., Masters, K., & Kennedy, K. (2013). Integrating back to sleep recommendations into Neonatal ICU practice. *Pediatrics 131(4).* DOI: 10.1542/peds.2012-1857

Griffin, J., Heald, A., Davidson, L. & Kent, A. (2016). A prospective audit of adherence to safe sleeping guidelines in a general pediatric ward and special care nursery. *Journal of Pediatrics and Child Health 52, p. 529-533.* DOI: 10.1111/jpc.13158

Harris, J., Roussel, L. & Thomas, P. (2014). Initiating and sustaining the clinical nurse leader role; A practical guide, 2nd edition. Burlington, MA. Jones and Bartlett Learning.

Institute for Healthcare Improvement. (2017). *Five characteristics of spreadable innovations.* Retrieved from: http://app.ihi.org/lmsspa/#/6cb1c614-884b-43ef-9abd-

d90849f183d4/ea07c796-a771-4713-8bd8-520188b6c793/lessonDetail/26bb0d17-0992-4a05-afd9-e77f842bcc5a/page/1

King, C. & Gerard, S. (2013). *Clinical nurse leader: Certification review.* New York, NY. Springer Publishing Co.

Malloy, M. (2013). Prematurity and sudden infant death syndrome: United states 2005-2007. *Journal of Perinatology 33, p. 470-475.* DOI: 10.1038/jp.2012.158

Matthews, R. & Moore, A. (2013). Babies are still dying of SIDS. *American Journal of Nursing 113(2) p.59-64.* DOI: 10.1097/01.NAJ.0000426692.19202.5a

Moon, R., Hauck, F. & Colson, E. (2016). Safe infant sleep interventions: What is the evidence for successful behavior change? *Current Pediatric Reviews 12, p. 67-75.* DOI: 10.2174/1573396311666151026110148

Patton, C., Stiltner, D., Wright, K., & Kautz, D. (2015). Do nurses provide a safe sleep environment for infants in the hospital setting? An integrative review. *Advances in Neonatal Care 15(1) p.8-22.* DOI: 10.1097/ANC.0000000000000145

Appendix A

Safe Sleep Bed Audit

Rm #	Gestation	Sleep Position	Bed Flat?	Items in bed? If so, what?	Blankets under arms?	NG?

Appendix B

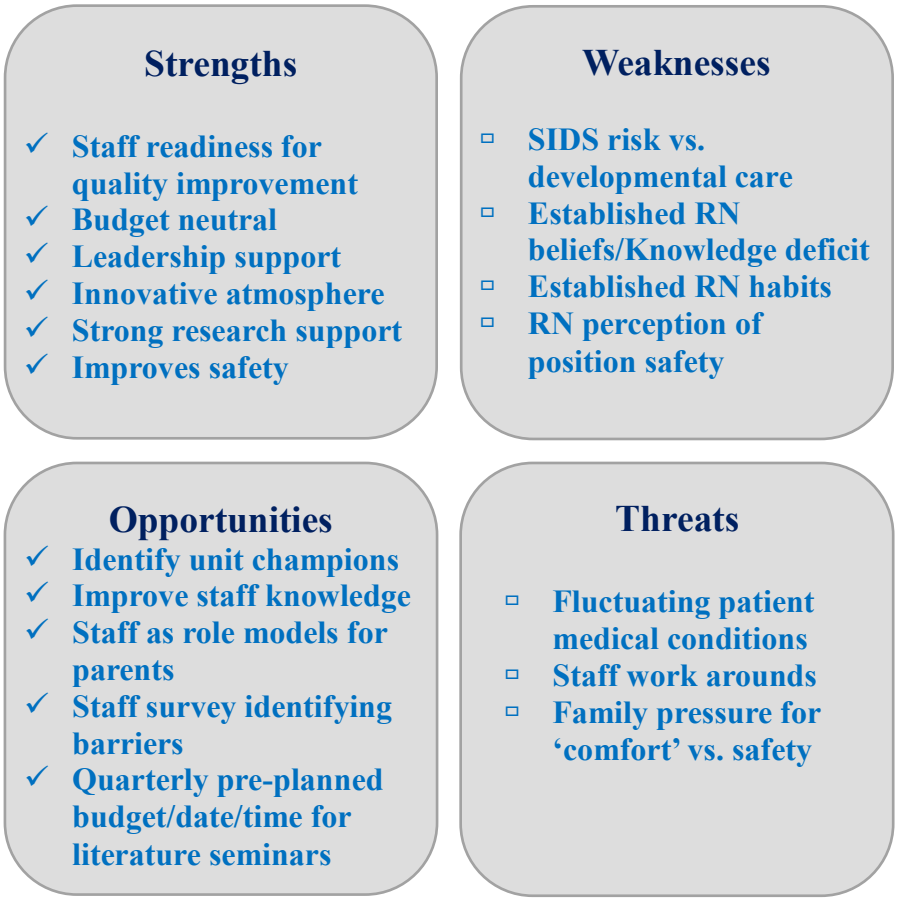
Roger's Change Theory Scorecard

	Relative Advantage	Simplicity	Compatibility	Trialability	Observability
Definition	The degree to which an innovation is perceived as better than the idea it supersedes	The degree to which an innovation is perceived as simple to understand and use	The degree to which an innovation is perceived as being consistent with the existing values, experiences, beliefs, and needs of potential adopters	The degree to which an innovation can be tested on a small scale	The degree to which the use of an innovation and the results it produces are visible to those who should consider it
Score	1	5	3	5	5

Score: 1 — "The change is very weak relative to this attribute."
3 — "The change is okay relative to this attribute."
5 — "The change is very strong relative to this attribute."

Appendix C

SWOT analysis of the NICU



Appendix D

NICU RN Pre-Survey

NICU Newborn Sleep Safety Survey

At what gestational age should a NICU baby be positioned supine only, if at all?
59% answered 34 weeks, which is current unit policy

Are there reasons why prone would be allowed at any gestation? If so, what are they?

It is ok to continue to use some developmental position aids without an order, even when infant is in supine position and in open crib
TRUE FALSE

I believe it's ok for a NICU baby to be prone or side-lying because they are on monitors and I will teach parents the proper home guidelines
TRUE FALSE
32% answered true

A NICU patient is at higher risk for aspiration when placed supine
TRUE FALSE
27% answered true

Raised HOB is allowed for reflux precautions without an order
TRUE FALSE

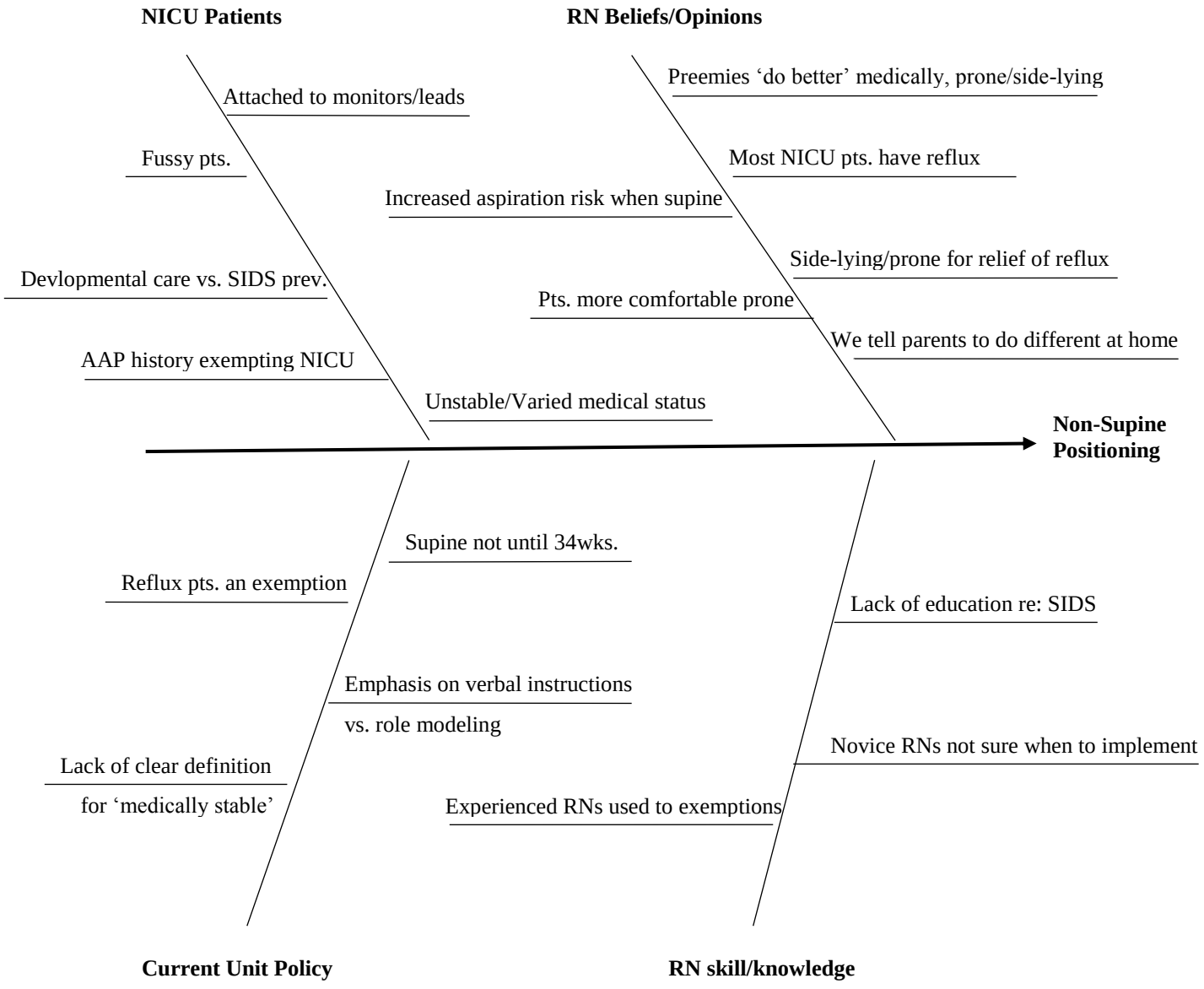
If my baby is double swaddled and having temperature instability, I would add an additional blanket
TRUE FALSE

If a newborn should fall, I know what paperwork to fill out and where to find it
TRUE FALSE

I educate all my parents on sleep safety
TRUE FALSE

Appendix E

Root Cause Analysis



Appendix F

Timeline- Ganntt Chart for Safe Sleep Project

Action	By	Nov'16	Dec'16	Jan'17	Feb'17	Mar'17	Apr' 17	May 17
Develop RN Survey	CNL & CNS	11/7/16						
Propose Safe sleep to RN Unit Council	CNS		12/2016					
RN Survey	CNL			1/15/17				
Summarize Survey Results	CNL				2/11/17			
Present Survey Results to FCC	CNL				2/14/17			
Compare unit policy to 2011 AAP guidelines	CNL & CNS				2/27/17			
Approve policy changes	CNL,CNS, RN ldrs, Med. Dir.				2/28/17			
Create Safe Sleep Power Pt	CNL					3/9/17-3/10/17		
Present policy at staff mtg.	CNL					3/13/17		
Conduct Lit. Review Seminar	CNL & CNS					3/13/17		
Finalize ed. module	CNL					3/27/17		
Bed Audit	CNL						4/03-4/04/17	
Presentation emailed to RNs	CNS						4/03/2017	

Launch Online Ed. Module	CNS & Nrsg Ed.						4/25/2017	
Bed Re-Audit and Staff Re-Survey	CNL							5/10/2017