

University of Louisville

ThinkIR: The University of Louisville's Institutional Repository

Doctor of Nursing Practice Papers

School of Nursing

7-2019

Safe Sleep in the NICU

Amy Rudd

University of Louisville, amrudd688@gmail.com

Follow this and additional works at: <https://ir.library.louisville.edu/dnp>



Part of the [Nursing Commons](#)

Recommended Citation

Rudd, Amy, "Safe Sleep in the NICU" (2019). *Doctor of Nursing Practice Papers*. Paper 26.

Retrieved from <https://ir.library.louisville.edu/dnp/26>

This Doctoral Paper is brought to you for free and open access by the School of Nursing at ThinkIR: The University of Louisville's Institutional Repository. It has been accepted for inclusion in Doctor of Nursing Practice Papers by an authorized administrator of ThinkIR: The University of Louisville's Institutional Repository. This title appears here courtesy of the author, who has retained all other copyrights. For more information, please contact thinkir@louisville.edu.

SAFE SLEEP IN THE NICU

By

Amy Rudd

Paper submitted in partial fulfillment of the
requirements for the degree of

Doctor of Nursing Practice

University of Louisville
School of Nursing

Date Finalized

Sharon Jackson Barton PhD, RN July 19, 2019

Signature DNP Project Chair

Date

Victoria Hines Parker PhD RN July 22, 2019

Signature DNP Project Committee Member

Date

Sue Roberts 8.13.19

Signature Program Director

Date

Mary DeRitter 8.13.19

Signature Associate Dean for Academic Affairs

Date

Acknowledgements

I would like to thank my family and friends for their endless support, encouragement, and patience throughout the completion of my course of study and this project, my project committee for their efforts and countless hours spent reviewing project materials, and my cohort instructors for their support throughout the program.

Table of Contents

Manuscript Title Page.....	1
Acknowledgments.....	2
Manuscript Abstract.....	4
Manuscript.....	5
References.....	20
Appendix A: Evidence Table.....	24
Appendix B: Logic Model.....	32
Appendix C: Survey Flyer.....	33
Appendix D: Budget.....	34
Appendix E: Survey Question Outline.....	35
Table 1: Nurse Beliefs on AAP Recommendations and Unit Policy.....	41
Table 2: Timing of Safe Sleep Practice and Formal Safe Sleep Education.....	41
Table 3: RN Practice of Safe Sleep and Parent Education.....	42
Table 4: Barriers to Practice.....	43
Table 5: Demographics.....	43
Table 6: Years of NICU Experience.....	44

Abstract

Sleep related infant deaths continue to be an issue in Kentucky with 95% of deaths having at least one sleep related risk factor identified. Evidence from the literature suggests safe sleep practice in the neonatal intensive care unit is inconsistent and nurses may face many barriers when implementing safe sleep. The purpose of this project was to determine current nursing knowledge and practice of safe sleep, as well as how parent education occurs in a local NICU through the use of a survey. The survey was developed and distributed to staff at University of Louisville Hospital NICU nurses to determine their current knowledge, practice, and any perceived barriers to safe sleep practice. Nurses working a minimum of six months prior to the survey period were eligible to participate in the survey, and adjunct staff members such as respiratory, physical, and occupational therapy were excluded. Survey participants were recruited with the use of posters within the unit as well an incentive gift card raffle upon completion of the survey. Survey results were analyzed using SurveyMonkey™ and Microsoft Excel™ to determine frequencies and means of nurses practicing safe sleep as described by the AAP. Survey results were limited by the low sample size and low participation rate, however, the results indicated nurses face barriers with implementing safe sleep and practice and education of caregivers begins as the infant nears discharge.

Key words: Safe sleep, preterm infant, NICU sleep, survey

Safe Sleep in the NICU

Supine infant sleep has been a well-known recommendation for more than 10 years. Over the years further guidelines have been introduced by the American Academy of Pediatrics (AAP) to improve the overall safety of the infant sleep environment. Safe sleep recommendations were updated by the AAP in 2016, which include the following recommendations: supine positioning, firm sleep surface, breastfeeding is recommended, room sharing with parents with a separate sleep area for the infant, removal of loose bedding and soft items, offering a pacifier during sleep, avoiding exposure to cigarette smoke, avoiding alcohol, tobacco and illicit drug use during and after pregnancy, avoid overheating and head covering, obtain regular prenatal care, follow AAP and Centers for Disease Control and Prevention (CDC) guidelines for infant immunizations, avoid use of commercial products which claim to decrease the risk of sudden unexplained infant death (SUID), refrain from the use of cardiorespiratory monitors as a method of reducing SUID, supervised tummy time during awake periods, use caution with swaddling infant and discontinue use as infant begins rolling, professionals caring for infants should endorse and model safe sleep, media and manufacturers should follow safe sleep guidelines in any messaging or advertising, continue public safe sleep campaigns, and continue research on SUID causes, risks, and reduction techniques. Each of these recommendations were the result of extensive research and review of the literature by Moon and the AAP Task Force on Sudden Infant Death Syndrome (2016). As part of this update on safe sleep practices the AAP has recommended safe sleep practice begin in neonatal intensive care units for stable infants of 32 weeks gestation or greater (Task for on Sudden Infant Death Syndrome, 2016).

Although rates of SUID and sleep related deaths decreased initially with the introduction of supine sleep position, current data from the CDC show rates of SUID have leveled off in

recent years nationally with no appreciable decrease in occurrence in recent years (2017). In 2016, there were 3600 reported SUID in the United States, with 900 of those attributed to accidental suffocation and strangulation in bed (CDC, 2018). In Kentucky the main causes of infant mortality are related to prematurity, birth defects, and SUID, with preliminary data for 2016 showing deaths related to SUID surpassing the number of prematurity related deaths which had previously been the leading cause of infant mortality in the state (Kentucky Cabinet for Health and Family Services, 2017). At the state level SUID deaths appear to be a growing problem, with 95% of cases of SUID presenting with at least one identified sleep risk factor such as bed sharing, loose objects in the sleep area, and improper sleep surface (Kentucky Cabinet for Health and Family Services, 2017). Despite recommendations for safe sleep practices, the number of infant deaths as a result of an unsafe sleep environment continues to be a problem. Addressing safe sleep practice in the hospital setting is an important aspect of promoting safe sleep practice at home to reduce the risk of SUID.

Problem Statement

Ostfeld, Schwartz-Soicher, Reichman, Teitler, and Heygi found the risk of SUID increases with decreasing gestational age (2017). Preventing SUID in this population is dependent upon educating parents on proper safe sleep practices prior to discharge from the NICU. Despite AAP recommendations, practicing safe sleep in the NICU is often difficult to achieve. Various positioning aids and equipment are necessary during the initial stabilization period for these infants and determining when an infant is ready to transition to safe sleep is not always clear to nursing staff.

Various teaching methods are used within the hospital setting to educate patients and their families. However, observation of practices by hospital staff can influence patient and

family learning and practice following discharge. Patton, Stiltner, Wright, and Kautz found parents were more likely to practice what they observed in the hospital setting rather than following verbal or written instruction (2015). Cadematori, Piranian, Skryzpek, and Pron found nurses are not always compliant with safe sleep practice or consistent with caregiver education (2016). Proper education and modeling of safe sleep in the NICU is important in minimizing additional risk of sleep related infant deaths in this vulnerable population. The rising rates of SUID at local and national levels suggest improvement is needed in how caregiver education is completed within the hospital setting, especially with caregivers of infant's already at increased risk of SUID.

Summary of the Evidence

A review of the current literature was performed with 20 articles obtained related to safe sleep practice in the NICU, which included 1 policy statement, 5 systematic reviews, 2 qualitative studies, 8 quasi-experimental, and 2 mixed methods studies. This review is presented in an evidence table in appendix A. In reviewing these articles several themes emerged including: increased risk of SUID with prematurity and other related risk factors, reduced risk of SUID with safe sleep practice, barriers inhibit the performance of safe sleep in the NICU setting, safe sleep practice in the NICU is inconsistent, and modeling of safe sleep in the hospital setting may improve parental knowledge and practice of safe sleep.

Smoking, bed sharing, non-supine sleep position, and prematurity may all increase the risk of sudden infant death syndrome or sleep related infant deaths (CDC, 2018). In 2017, Ostfeld et al., examined the literature and found strong evidence suggesting an increase in sudden unexplained infant deaths (SUID) with decreasing gestational age, linking the risk of earlier preterm birth with a higher risk for SUID. Patients born prematurely may also face

additional risks imposed by smoking and non-supine sleep position. While prone positioning can support respiratory status in a critically ill infant, this practice in a stable infant leads to a decreased physiologic ability to arouse in response to a stressor during sleep thus increasing the risk of SUID (Moon & AAP Task Force on Sudden Infant Death Syndrome, 2016). Infants born to mothers who smoke and those exposed to smoke also demonstrated a decreased ability to arouse to stressors during sleep and thereby increasing their risk for SUID (Moon & AAP Task Force on Sudden Infant Death Syndrome, 2016).

Although not often cited as a risk factor for SUID, socioeconomic factors and ethnicity may influence SUID rates. Zundo, Richards, Ahmed, and Coddington did find families of lower socioeconomic status were less likely to be compliant with safe sleep, as well as those receiving advice from family members despite knowing the association of unsafe sleep positions with the risk of SUID (2017). Families of lower socioeconomic status may be less capable of providing a safe sleep environment, and all providers should assess if the infant will have their own sleep area at home (Zundo, Richards, Ahmed, & Coddington, 2017). Providers should also be aware of any programs available within their community to assist these families.

Numerous studies included in this review examined nursing attitudes and beliefs towards safe sleep practice in the NICU. Infant comfort, fear of aspiration, the need for respiratory support, and developmental care practice were found to be barriers to safe sleep implementation among both nursing staff and parents in several studies (Barsman, Dowling, Damato, & Czeck, 2015; Patton, Stiltner, Wright, & Kautz, 2015; Gelfer et al., 2013; Hwang et al., 2015). The fear of aspiration leads many caregivers to reject AAP recommendations and even recommend unsafe sleep positions (Patton et al., 2015). According to the AAP prone positioning alters autonomic system control and greatly increases the risk of sudden infant death (2016).

In a qualitative study by Barsman, Dowling, Damato, and Czeck, nursing beliefs on safe sleep practice were examined and compared between NICU staff and transitional care unit (TCU) staff caring for preterm infants nearing discharge (2015). This study found the majority of TCU staff practiced safe sleep, while the NICU staff more frequently used positioning aids (Barsman et al., 2015). The NICU staff had more difficulty accepting safe sleep practice, which contradicts developmental care practices, and this practice of developmental care frequently continued beyond the AAP recommendation to discontinue use at 32 weeks corrected gestational age (Barsman et al., 2015). Developmentally appropriate positioning has clear benefits for unstable infants by providing containment, comfort, and supporting neurological development, which leads many caregivers to resist safe sleep practices, but it is crucial for nurses to determine when an infant is ready for transition to safe sleep practice (Barsman, Dowling, Damato, & Czeck, 2015). Implementing a protocol to aid caregivers in determining safe sleep readiness may be beneficial for successfully implementing a practice change to safe sleep in the NICU. In a systematic review, Cadematori, Piranian, Skryzpek, and Pron determined that although not all caregivers are compliant with safe sleep, persistent and consistent education is vital to decreasing the risk of SUID (2016). The AAP has also found that interventions that address providers' concerns are effective in improving behavior (2016).

Despite these barriers, in reviewing the literature Naugler and DiCarlo found hospitals with safe sleep policies in place demonstrated higher rates of safe sleep compliance (2018). Although nursing beliefs and behaviors may not align with AAP recommendations, nurses are more likely to provide safe sleep if a policy is in place as most nurses feel policies should be followed (Barsman, Dowling, Damato, & Czeck, 2015; Naugler and DiCarlo, 2018).

In order for a safe sleep program to be successful staff buy in is critically important, and thorough staff education may improve staff buy in and support of a safe sleep program (Macklin et al., 2016).

In order to address barriers to practice numerous studies in this review implemented quality improvement projects to improve staff education and compliance with current safe sleep recommendations. These studies used pre-and post-intervention testing and crib audits to determine the feasibility of implementing safe sleep practices within the hospital setting, as well as the effects on parental retention of knowledge and practice of safe sleep. Most of the studies found a positive impact on parental knowledge and practice of safe sleep following implementation of safe sleep practice within the hospital setting. In 2015, Goodstein, Bell, and Krugman used a quasi-experimental design to compare outcomes following the implementation of a comprehensive parent education program, to a national safe sleep study which included only written and verbal instruction. This study found higher knowledge retention and practice of safe sleep by parents with the comprehensive program, which additionally modeled safe sleep in the hospital (Goodstein, Bell, & Krugman, 2015). The design of this study allowed for long-term comparisons between the national sleep study group and the comprehensive education group, which was found to have higher rates of safe sleep practice long-term (Goodstein, Bell, & Krugman, 2015). Although the findings were positive for safe sleep modeling, this study did not include NICU patients. In 2016, Dufer and Godfrey, also demonstrated increased parental practice of safe sleep at 1-month post-discharge, however, this study was small and included bedside education sessions, but did not describe if safe sleep was consistently modeled during the infant's hospital stay.

Studies by Heitmann et al. (2017), Kellams et al. (2017), McMullen et al (2016), and Macklin et al. (2016), examined the feasibility and compliance with safe sleep practice implementation among caregivers in hospital settings, and were able to improve practice of safe sleep. The studies by Macklin et al (2016) and Heitmann et al (2017) examined the effect of statewide initiatives to improve safe sleep practice and found the state backed initiative encouraged the development of safe sleep programs as the state support and funding decreased the financial burden that facilities often face when implementing new protocols. McMullen et al was able to demonstrate hospital wide compliance with safe sleep practice for patients less than one year old, however more than 90% compliance was not effectively demonstrated until 14 months post-implementation (2016).

Several of the included studies examined safe sleep practices in the NICU setting. In similar study designs Hwang et al (2015) and Gelfer et al (2013) implemented protocols to determine safe sleep readiness within the NICU setting and monitored compliance to these protocols. Hwang et al found that preterm infants were less likely to be placed in supine sleep positions prior to implementation and found a significant improvement in safe sleep practice following protocol implementation (2015). This study showed that safe sleep in the NICU is feasible and the importance of safe sleep education occurring weeks to months prior to NICU discharge (Hwang et al., 2015). Gelfer et al., found increased safe sleep compliance among healthcare providers as well as a significant increase in parental compliance with safe sleep post-discharge (2013).

Two studies compared safe sleep practice between well-baby nurseries and NICUs. Griffin et al found high compliance with supine sleep position in both well-baby nurseries and NICUs, but low compliance with the removal of extra items and head gear in the cribs of NICU

patients (2015). The extra items placed in cribs in this study were items used for developmental care, such as positioners, or used for respiratory support of the infant which would place the infant at increased risk if continued at home (Griffin et al., 2015). In 2013 Fowler et al, directly compared safe sleep practice following discharge of well-baby nursery patients and NICU patients. The study found a higher compliance rate with safe sleep in NICU graduates, however, the NICU had a safe sleep program in place while the well-baby nursery did not (Fowler et al., 2013).

Although barriers are identified in the literature, there is also adequate support for safe sleep programs which can be feasibly implemented in the NICU setting. Practice of safe sleep in the NICU setting is often inconsistent and may vary from practice in well baby nurseries. Current data on SUID rates in Kentucky are concerning and examining how safe sleep is modeled and how parents are educated in the NICU setting through this survey was needed to identify if nursing knowledge is adequate, if barriers exist, and determine how practice could be improved to make an impact at a local level.

Theoretical Framework

Mefford's Theory of Health Promotion in Preterm Infants is used as the conceptual framework for this project. This model focuses on care of the patient and the family as a whole and how threats both internally through their disease processes, and externally through the physical environment threatens each system, and how nursing adaptations conserve patient wholeness through maintaining energy balance, structural integrity, personal integrity, and social integrity (Mefford, 2004). According to Mefford's model premature birth disrupts energy balance, structural integrity, social integrity, and personal integrity affecting the patient and the family as a whole (2004). To promote the health and well-being of the patient and family as a

whole, energy balance and structural integrity are addressed during the initial stabilization and developmental care of the infant. However, proper transition to safe sleep is needed to continue promotion of the infant and family as whole to maintain personal and structural integrity of the family unit through promotion of safe infant sleep practice beyond the infant's hospital stay. The aim of this project is to examine how and if nursing adaptations align with Mefford's theory to conserve patient and family wholeness.

Setting and Organizational Assessment

The site selected for this project was chosen based on the population served and the number of patients and nursing staff at the facility. The NICU at University of Louisville Hospital is a level 3, 28 bed unit with no out-born patients (2017). In 2017, 305 infants were admitted to the NICU over the course of the year (University of Louisville Hospital, 2017). At the time of this survey 51 nurses were employed in the NICU at this facility and were eligible to participate in the survey. The NICU staff had recently undergone additional training and education on safe sleep practice and the survey was welcomed by the unit manager and clinical research staff to assist with evaluation of recent education efforts.

Purpose

The purpose of this project was to determine the nursing knowledge of safe sleep recommendations, consistency of parent safe sleep education among nursing staff, and currently perceived barriers to safe sleep practice and education of parents in the NICU at University of Louisville Hospital. Influencing parents to practice safe sleep recommendations at home is an important step in reducing the number of infant sleep related deaths at a local level. A logic model describing the activities and goals of this project can be found in appendix B.

Intervention

In order to assess how safe sleep is practiced in the NICU at a local level a survey of nursing staff on their knowledge, practice and parent education on safe sleep was performed. The survey was developed based on current AAP recommendations and literature findings and made available through a link to the survey on the SurveyMonkey™ website. Approval for this project was given by the Institutional Review Board at University of Louisville as well as site approval from the University of Louisville Hospital research committee.

Participants

The target population for the survey was direct care nurses employed in the NICU at University of Louisville Hospital for at least 6 months prior to the start of the survey period. Adjunct positions such as occupational therapy, physical therapy, and respiratory therapy were excluded as well as any nurses in orientation during the survey period. The goal participation rate was at least 30-50% or more of the eligible 51 staff nurses to allow for adequate data collection. Consent of the participants was assumed upon entry to the survey and was indicated via a preamble on the survey website prior to entry. Nurses were recruited for the survey through the use of flyers placed in the unit and an optional entry for a gift card raffle for survey participants. The survey flyer can be viewed in appendix C.

Data Collection

All data collected during the survey was stored on a password protected laptop with data encryption for the data file. The SurveyMonkey™ website also provides additional security measures to maintain data safety. HIPAA was followed throughout the project completion and no patients were involved in this project. Budgetary impacts for this project were minimal and a more detailed description of the financial implications of this project can be found in appendix D.

Measurement

An online survey was developed with 10 multiple response questions based on current AAP guidelines for safe sleep practice in the NICU. Questions responses used a Likert scale to determine how nurses viewed the elements of the AAP's safe sleep guidelines or the frequency or quality of education of caregivers. An outline of the survey questions can be found in appendix E. Demographic information collected was optional for respondents to determine years of nursing experience and years of NICU nursing experience and can be found in Tables 5 and 6.

Results

The target population for this project included 51 eligible nurses, with surveys completed by 12 of these individuals during the 10-week survey period for a sample size of 12. Frequency and means of responses were calculated using Microsoft Excel™ as well as through SurveyMonkey™. The majority of survey responses collected were among nurses with greater than 16 years of NICU nursing experience. The survey results reflected previous studies demonstrating nursing knowledge of the current AAP guidelines, but did suggest developmental care practice often continues beyond the recommended time frame. A complete set of results can be seen in Tables 1 through 4. When questioned directly about their beliefs regarding the current AAP recommendations, greater than 50% of nurses' beliefs aligned with the current guidelines. However, more than 50% of nurses did also indicate that developmental care practice continues beyond 32 weeks gestation, but their view of the importance of continuing developmental care practice varied among participants with 50% believing developmental care was continued too long while the remaining participants were neutral or disagreed. Further details on nurse opinions on developmental care practice can be found in Table 1.

How parent education occurs and when education begins was also evaluated with this survey with the data presented in Tables 2 and 3. The majority of nurses, 50% responded that safe sleep education most commonly occurs within 2 weeks of expected discharge, with formal education with written materials occurring 2 weeks prior to discharge by 58% of respondents, and additional use of websites, video and other media occurring within 2 weeks of discharge as indicated by 90% of respondents. Not only does a majority of formal education begin at 2 weeks, but so does the practice of placing infants in strict safe sleep. None of the participants indicated education solely occurs at discharge, however only 3 respondents indicated safe sleep education begins with stabilization of the infant, while the remainder indicated education begins as the infant is transitioned to an open crib or within 2 weeks of discharge. Furthermore, none of the participants indicated that safe sleep education begins upon hospital admission in the NICU setting, which would be difficult given the patient population and unique needs.

Developmental care is often cited as a barrier to practice of safe sleep in the NICU. Nurses surveyed indicated they somewhat agreed or were neutral on whether they felt developmental care conflicted with their practice of safe sleep while only 2 disagreed. When asked about beginning the transition to safe sleep, 4 nurses indicated they felt somewhat confused about when to begin while 5 were neutral, and 3 disagreed. Although some nurses expressed confusion the majority agreed or somewhat agreed that their current unit policy expressed clear expectations on when to transition to safe sleep. This data is presented in Tables 1 and 4. Although adjunct providers such as occupational therapy (OT) or physical therapy (PT) were not surveyed on their knowledge or practice of safe sleep, 9 nurses indicated OT/PT sometimes recommend devices or positioning which conflict with safe sleep and the remaining 3 indicated this was very likely to occur. The full results of the nurse's responses to barriers can be

seen in Table 4. Parents of the infants may also be a barrier to practice of safe sleep. Seventy-five percent of nurses indicated parental beliefs and cultural practices may also prevent appropriate safe sleep from occurring during hospitalization and post-discharge.

Discussion

Interpretation

As Mefford's Theory of Health Promotion in preterm infant's demonstrates, infants admitted to the NICU face multiple threats to conservation of wholeness of both self and the family unit. Inappropriate practice and education on safe sleep presents a threat to wholeness of the infant and family if improper sleep practices continue beyond discharge. This survey demonstrated there is a fine balance to maintaining wholeness through developmental care, while also promoting wholeness through discharge education of the family, specifically with safe sleep education and practice. Although the sample size and participation rates were low, the results of this survey support recent literature on safe sleep suggesting nurses face barriers to practicing safe sleep and often begin safe sleep practice and education as the infant nears discharge. At UofL NICU these barriers stem from recommendations from adjunct providers and confusion surrounding when to begin safe sleep practice. This may be related to an algorithm used by these providers to determine if an infant should be placed in developmental care or is ready for safe sleep practice. Although studies have shown algorithms such as these to be beneficial to consistency of practice, there may be confusion for providers in the use of the algorithm especially with infants who fall into gray areas on the algorithm. Although the survey did not indicate practice and education always begins at 32 weeks gestation, a majority of nurses indicated specific handouts, scripts, or other media are used by nurses when educating caregivers on safe sleep.

Limitations

Due to the low response rate for this survey, the results of this survey cannot be generalized to the population surveyed. Only 24% of those eligible participated in the survey, with a participation rate of greater than 80% needed for a 95% confidence interval. Electronic surveys have become increasingly popular, but obtaining usable data is often problematic (Magro, Prybutok, & Ryan, 2014). A Study by Magro, Prybutok, and Ryan found offering an incentive for participation and active recruitment techniques led to higher participation than passive recruitment and a lack of incentive (2014). Sending multiple reminders for electronic surveys has been proven to increase participation levels with online surveys as well (Aerny-Perretten, Dominguez-Berjon, Esteban-Vasallo, & Garcia-Riolobos, 2015). Although an incentive was offered and recruitment was conducted through multiple employee e-mails and unit flyers, this was not effective in increasing participation. Other studies have found having a choice in the mode of participation by offering participation via phone interview or by paper response was successful in improving participation as participants didn't feel hindered by one method of data collection (Heijmans, Lieshout, & Wensing, 2015). Multiple data collection methods were not used for this survey and should be considered in future surveys.

Conclusion

Results of this survey were shared with the NICU unit manager through a PowerPoint presentation of the survey responses in hopes of continuing improvement of safe sleep practice and parent education in the unit. Although the results of this survey could not be generalized to the NICU population, the findings did support previous literature demonstrating the existence of barriers to practice and delayed implementation of safe sleep in the NICU, as well as highlighting specific barriers within this facility. The continued rise of SUID rates in Kentucky

should prompt providers for newborns and preterm infants to examine their current practice of safe sleep and caregiver education. Infants in the NICU are a vulnerable population with an increased risk of SUID. Care should be taken to thoroughly demonstrate, educate and empower parents and caregivers to utilize safe sleep when appropriate for the infant using an individualized approach to determine infant readiness for the transition from developmental care to safe sleep practice to adequately prepare families for safety during sleep beyond the hospital stay.

References

- AAP Task Force on Sudden Infant Death Syndrome. (2016). SIDS and other sleep-related infant deaths: Updated 2016 recommendations for a safe infant sleeping environment. *Pediatrics* 138(5), 1-12. doi: 10.1542/peds.2016-2938
- Aerny-Perretten, N., Dominguez-Berjon, F, Esteban-Vasallo, M.D., & Garcia-Riolobos, C. (2015). Participation and factors associated with late or non-response to an online survey in primary care. *Journal of Evaluation in Clinical Practice*, 21, 688-693. doi: 10.1111/jep.12367
- Barsman, S.G., Dowling, D.A., Damato, E.G., & Czeck, P. (2015). Neonatal nurses' beliefs, knowledge, and practices in relation to sudden infant death syndrome risk-reduction recommendations. *Advances in Neonatal Care*, 15, 209-219. doi: 10.1097/ANC.0000000000000160
- Cadematori, M.E., Piranian, M.A., Skrzypek, P.A., & Pron, A.M. (2016). Caregiver compliance with safe sleep guidelines. *Newborn and Infant Nursing Reviews*, 16, 122-125. doi: <http://dx.doi.org/10.1053/j.nainr.2016.08.004>
- Centers for Disease Control and Prevention. (2018). Sudden unexpected infant death and sudden infant death syndrome: Data and statistics. Retrieved from: <https://www.cdc.gov/sids/data.htm>
- Dufer, H., & Godfrey, K. (2016). Integration of safe sleep and SIDS education among parents of preterm infants in the neonatal intensive care unit. *Journal of Neonatal Nursing*, 23, 103-108. doi: 10.1016/j.jnn.2016.09.001

- Fowler, A.J., Evans, P.W., Etchegaray, J.M., Ottenbacher, A., & Arnold, C. (2013). Safe sleep practices and sudden infant death syndrome risk reduction: NICU and well-baby graduates. *Clinical Pediatrics* 52, 1044-1053. doi: 10.1177/0009922813506038
- Gelfer, P., Cameron, R., Masters, K., & Kennedy, K.A. (2013). Integrating back to sleep recommendations into neonatal ICU practice. *Pediatrics*, 131, e1264-e1270. doi: 10.1542/peds.2012-1857
- Goodstein, M.H., Bell, T., & Krugman, S.T. (2015). Improving infant sleep safety through a comprehensive hospital-based program. *Clinical Pediatrics*, 54, 212-221. doi: 10.1177/0009922814566928
- Griffin, J., Heald, A., Davidson, L., & Kent, A.L. (2015). A prospective audit of adherence to safe sleeping guidelines in a general paediatric ward and special care nursery. *Journal of Paediatrics and Child Health*, 52, 529-533. doi:10.1111/jpc.13158
- Heijmans, N., Lieshout, J.V., Wensing, M. (2015). Improving participation rates by providing choice of participation mode: Two randomized-controlled trials. *BMC Medical Research Methodology*, 15(29), 1-10. doi: 10.1186/s12874-015-0021-2
- Heitmann, R., Nilles, E.K., Jeans, A., Moreland, J., Clark, C., McDonald, M.F., & Warren, M.D. (2017). Improving safe sleep modeling in the hospital through policy implementation. *Maternal and Child Health Journal*, 21, 1995-2000. doi: 10.1007/s10995-017-2334-8
- Hwang, S.S., O'Sullivan, A., Fitzgerald, E., Melvin, P., Gorman, T., & Fiascone, J.M. (2015). Implementation of safe sleep practices in the neonatal intensive care unit. *Journal of Perinatology*, 35, 862-866. doi:10.1038/jp.2015.79
- Kellams, A., Parker, M.G., Geller, N.L., Moon, R.Y., Colson, E.R., Drake, E., &...Hauck, E.R. (2016). Today's Baby quality improvement: safe sleep teaching and role modeling in 8 US

- maternity units. *Pediatrics*, 140(5), e20171816. doi: <https://doi.org/10.1542/peds.2017-1816>
- Kentucky Cabinet for Health and Family Services. (2017). *Public Health Child Fatality Review Program 2017 Annual Report*. Frankfort, KY: KY Cabinet for Health and Family Services, Department for Public Health, Division of Maternal and Child Health, 2017. Retrieved from: <http://chfs.ky.gov/dph/mch/cfhi/childfatality.htm>
- Macklin, J.R., Gittelman, M.A., Denny, S.A., Southworth, H., & Arnold, M.W. (2016). The EASE quality improvement project: Improving safe sleep practices in Ohio Children's Hospitals. *Pediatrics* 138(4), e1-e8. doi: 10.1542/peds.2015-4267
- Magro, M.J., Prybutok, V.R., & Ryan, S.D. (2014). How survey administration can affect response in electronic surveys. *Quality and Quantity*, 49, 2145-2154. doi: 10.1007/s11135-014-0098-4
- Mefford, L.C. (2004). A theory of health promotion for preterm infants based on Levine's conservation model of nursing. *Nursing Science Quarterly*, 17(3), 260-266. doi: 10.1177/0894318404266327
- McMullen, S.L., Fioravanti, I.D., Brown, K.B., & Carey, M.G. (2016). Safe sleep for hospitalized infants. *MCN, The American Journal of Maternal/Child Nursing*, 41(1), 43-50. doi: 10.1097/NMC.0000000000000205
- Moon, R.Y. & AAP Task Force on Sudden Infant Death Syndrome. (2016). SIDS and other sleep-related infant deaths: Evidence base for 2016 updated recommendations for a safe infant sleeping environment. *Pediatrics*, 138(5), e1-e34. doi: 10.1542/peds.2016-2940

- Naugler, M.R. & DiCarlo, K. (2018). Barriers to and interventions that increase nurses' and parents' compliance with safe sleep recommendations for preterm infants. *Nursing for Women's Health*, 22(1), 24-39. doi: <https://doi.org/10.1016/j.nwh.2017.12.009>
- Ostfeld, B.M., Schwartz-Soicher, O., Reichman, N.E., Teitler, J.O., & Hegyi, T. (2017). Prematurity and sudden unexpected infant deaths in the United States. *Pediatrics*, 141(1), e1-e8. doi: 10.1542/peds.2016-3334
- Patton, C., Stiltner, D., Wright, K., & Kautz, D.D. (2015). *Advances in Neonatal Care*, 15(1), 8-22. doi: 0.1097/ANC.000000000000145
- Shadman, K.A., Wald, E.R., Smith, W., & Coller, R.J. (2016). Improving safe sleep practices for hospitalized infants. *Pediatrics* 138(3), e1-9. doi: 10.1542/peds.2015-4441
- University of Louisville Hospital. (2017). Center for women and infants. Retrieved from: <https://uoflhospital.org/services/center-women-infants>
- Varghese, S., Gasalberti, D., Ahern, K., & Chang, J.C. (2015). An analysis of attitude toward infant sleep safety and SIDS risk reduction behavior among caregivers of newborns and infants. *Journal of Perinatology*, 35, 970-973. doi:10.1038/jp.2015.111
- Zundo, K., Richards, E.A., Ahmed, A.H., & Coddington, J.A. (2017). Factors associated with parental compliance with supine infant sleep: an integrative review. *Pediatric Nursing*, 43(2), 83-91. Retrieved from: <http://web.b.ebscohost.com/echo.louisville.edu/ehost/pdfviewer/pdfviewer?vid=3&sid=85e20e31-133f-48d5-b656-1ee566fd174d%40sessionmgr101>

Appendix A
Evidence Table

Citation	Level of Evidence	Conceptual Framework Theory	Design/Methods Sample/Setting Measures/Tools	Data Analysis Findings	Quality of Evidence/ Critical Worth to Practice Strengths/weaknesses of study
AAP Task Force on Sudden Infant Death Syndrome, 2016	Level I	None identified	Design methods not described in this article. Article refers to separate technical report. All recommendations and studies used pertain to infants under 1 year of age. Data used for determining recommendations are the result of epidemiologic case-control studies. Data is presented separately in technical report.	Statistical analysis not described in this article. Authors refer to separate technical report. Recommendations for practice as follows: Back to sleep for every sleep, firm sleep surface, breastfeeding recommended, parental room sharing with separate sleep surface, remove soft objects and loose bedding, offer pacifier with sleep, avoid smoke exposure, alcohol, and illicit drug use during pregnancy and after birth, avoid head covering and overheating, regular prenatal care, follow immunization recommendations, avoid commercial positioners, do not use home cardiorespiratory monitors to reduce risk of SIDS, supervised tummy time recommended, swaddling does not decrease risk, staff in newborn nurseries, NICUs, and child care facilities should model and endorse safe sleep, media and manufacturers should follow safe sleep guidelines in messaging and advertisements, public education and safe to sleep campaign should continue, and continued research and surveillance of risk factors should continue.	Clinical practice guideline published by American Academy of Pediatrics. Guideline is clearly explained and applicable to practice. The guideline recommends for safe sleep to begin in NICUs when infants are medically stable, but the definition of medically stable is not defined. Guideline further explains supine sleep should begin well before discharge. Positioning for infants with certain medical conditions is briefly discussed, but supine sleep remains as the recommended practice unless evidence suggests a higher risk with supine sleep in these infants. Implementation strategies are not discussed in this article. Evidence from which recommendations were made is not thoroughly discussed in this article. Table presented with strength of evidence for each recommendation. Technical report presented separately with this evidence.

Moon, R.Y. & AAP Task Force on Sudden Infant Death Syndrome, 2016	Level I	None identified.	Literature review 63 new studies were included in this literature review. Measurement tools not adequately described.	Some statistical data presented from supporting articles from the literature review. Supporting evidence for each recommendation in the updated safe sleep guideline is thoroughly discussed. Important evidence for positioning in premature infants is discussed in this article.	This technical report provides additional explanation of safe sleep recommendations and thoroughly discusses supporting evidence. Evidence is presented in sections with regards to topics related to safe sleep practice. Problem background is discussed with information presented on racial and ethnic disparities, issues with determining cause of death, age at death, and pathophysiologic and genetic factors that may contribute to sudden unexpected infant death.
Macklin, Gittelman, Denny, Southworth, & Arnold, 2016	Level VI	Plan, Do, Study, Act model.	Quality Improvement Project 5343 audits completed over the course of this study at 6 different hospitals. Audit questionnaire used, but not adequately described. Audits entered into survey monkey.	Frequencies used to measure number exhibiting safe sleep. Z-tests used to track differences from baseline data. Project led to increased modeling of safe sleep by health care providers. Significant increase in family education on safe sleep practices.	Much of the reported data came from a single institution, though individual analysis suggested similar improvements. Staff education was not adequately described. Each center had the option to limit which units were audited. NICUs were excluded from these audits. Audits were performed only between the hours of 9:00 PM to 7:00 AM.
Varghese, Gasalberti, Ahern, & Chang, 2015	Level VI	None identified.	Quality Improvement Project. Questionnaire used to determine caregiver beliefs on safe sleep practice. Sample of 121 adult caregivers of infants born at Staten Island University Hospital between January and October 2013.	Mean, mode, and standard deviation calculated for all interval and ordinal level data. T-tests used to compare groups based on socioeconomic status. Chi-square analysis used for categorical data. Teaching and modeling safe sleep found to have synergistic affect and improved caregiver	Findings suggest modeling and teaching improved knowledge of caregivers. Sample is small and predominantly Caucasian. Sample may present problems when interpreting data due to lack of diversity among sample.

			Questionnaire developed based on 2011 AAP safe sleep recommendations. Likert scale used for question responses. Flesch-Kincaid grade level of 6.0 used with sample limited to individuals who could read and speak English at 6 th grade level. Flesch Reading Ease score 69.2.	awareness and practice of safe sleep.	
Patton, Stiltner, Wright, & Kautz, 2015	Level V	None identified	Literature review 16 studies met inclusion criteria for this review. Sample sizes of nurses ranged from 94-5911 with studies including parents ranging from 100-671. Questionnaires used in 12 studies and personal interview used in 4 studies. Measurement tools not discussed.	Statistical analysis of data was not discussed. Sleep practices by nurses can influence parental sleep practice. Inconsistencies in instruction and practice can confuse parents. Parents are more likely to practice what they observed rather than what they were instructed to do in discharge teaching. Nursing knowledge of safe sleep is inconsistent amongst studies suggesting the need for further education exists.	Inclusion criteria and search methods clearly described. Study findings were adequately described in the article and in table format. Demographic information is not described. Sample sizes of the included studies vary. Strength of evidence of the included studies is not discussed.
Zundo, Richards, Ahmed, & Coddington, 2017	Level V	None identified	Literature review Sample sizes ranged from 57 to 6421 among the 16 included studies. Questionnaires, surveys, focus groups, interviews, and surveys were used for data collection in the selected studies. The continuity of care data collection tool and Ganong's stages of integrative review were used in the search process.	Statistical analysis was not discussed. Low socioeconomic status contributed to noncompliance with supine sleep. Early access to prenatal care improved supine sleep practice. Concerns about infant comfort, choking risk, and advice of relatives remain as barriers to safe sleep practice. Half of all parents from all included studies knew SIDS was associated with sleep position.	Table presents design and major findings for each study. Demographic information and its implications for safe sleep practice are thoroughly discussed. Each barrier to safe sleep is adequately discussed as well as ways to address these barriers in practice. Sample sizes varied greatly between studies as well as demographic characteristics.
Hwang, O'Sullivan, Fitzgerald, Melvin, Gorman, & Fiascone, 2015	Level VI	None identified	Quality improvement project Algorithm developed to determine infant eligibility for NICU therapeutic positioning or safe sleep positioning. Audits performed 2 weeks after intervention to determine compliance and adherence to safe sleep practice. Sample of 755 with 395 eligible for safe sleep practice during study period. Study conducted at 2 level III NICUs.	Data from audit were summarized using categorical variables and percentages. Significant improvement in safe sleep practice occurred post-intervention. Removal of unsafe objects from cribs was area of greatest improvement, but also the area of highest noncompliance.	Post-discharge adherence to safe sleep practice was not measured in this study. Study period was brief, only lasting 2 weeks. Study shows implementing safe sleep practice in NICUs is feasible.

			Algorithm adapted from previous study.		
Goodstein, Bell, & Krugman, 2015	Level III	None identified	<p>Quasi-experimental design</p> <p>Comprehensive education program was implemented including modeling of safe sleep, video, and written education. Parental knowledge of safe sleep practice was assessed via surveys at discharge and at 4 months post-discharge, and compared with a national safe sleep study.</p> <p>Sample size at discharge 1092 with 490 at 4 month follow up.</p> <p>Comparison group sample size 1046 at 4 month follow up.</p>	<p>Statistical analysis was completed using the SPSS program to run chi-square and z-tests of proportion.</p> <p>Higher retention and compliance of safe sleep practice occurred with the comprehensive education program that included modeling.</p> <p>Safe sleep practices could be carried out in the hospital setting, and parent education was accepted and effective.</p>	<p>There was not randomization or a control group.</p> <p>Demographics differed slightly between comparison groups.</p> <p>The comprehensive education approach led to higher practice of safe sleep when compared to current education practices.</p> <p>This study included very few minorities therefore the effect of cultural practices could not be determined.</p>
Heitmann, Nilles, Jeans, Moreland, Clark, McDonald, & Warren, 2017	Level VI	None identified	<p>Quality improvement</p> <p>Safe sleep policies were designed and implemented at 71 hospitals.</p> <p>Audits were conducted to assess compliance.</p> <p>71 hospitals included in this statewide study.</p>	<p>Descriptive statistics were used to summarize training, parent education, and audits.</p> <p>Chi-square and repeated measures analysis of variance was used to assess impact of policy implementation.</p> <p>High participation and compliance demonstrate that safe sleep practices can be implemented on a large scale.</p> <p>Support from the state and assistance helped to ease the financial burden associated with adopting policy change.</p>	<p>Demographic characteristics not discussed.</p> <p>Impact of policy change on parent knowledge and practice of safe sleep was not measured.</p> <p>Study thoroughly analyzed and described staff compliance.</p> <p>Staff education and implementation practices varied among hospitals.</p>
Shadman, Wald, Smith, & Collier, 2016	Level VI	Plan, Do, Study, Act model	<p>Quality improvement project.</p> <p>Process change was developed and implemented following PDSA cycle. Nursing knowledge was assessed before and after intervention.</p> <p>Parental knowledge and safe sleep practice was assessed following discharge.</p> <p>Crib audits were performed during study period.</p> <p>Sample of 316 at a single hospital</p>	<p>Before and after intervention data was compared using chi-square and t-tests.</p> <p>While nursing knowledge tended to increase following implementation, this did not translate into practice.</p> <p>Parent safe sleep practice did not improve following implementation.</p>	<p>Small sample size limits the power of this study.</p> <p>Process improved nursing knowledge but did not improve modeling of safe sleep.</p> <p>Caregiver compliance was measured following a period of low safe sleep compliance within the hospital and may have affected the results of this study.</p>

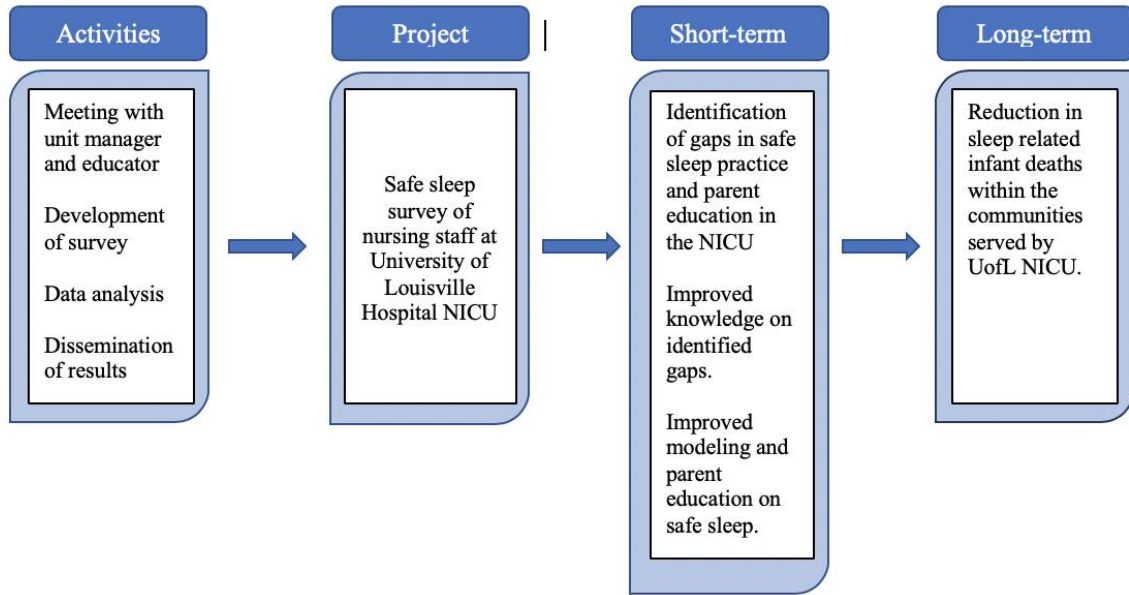
Gelfer, Cameron, Masters, & Kennedy, 2013	Level VI	None identified. May follow plan, do, study, act model.	Quality improvement Nurses educated on safe sleep practice. An algorithm was made based on AAP guidelines and implemented. Parents were educated on safe sleep practice. Crib audits were performed. A questionnaire was completed via telephone interview with parents following discharge to assess safe sleep practice at home. Sample size not defined. Algorithm used to determine safe sleep readiness and was adapted for use in this center.	Before and after comparisons were made using Fischer's exact test. Nurses did not readily accept safe sleep practice. It was further determined that the timing of implementation increased nursing compliance. Safe sleep compliance increased following implementation. Parental compliance with safe sleep practice improved significantly.	The timing of implementing safe sleep practice may affect staff compliance and acceptance. Algorithm developed to determine safe sleep readiness is feasible for practice and aided in nursing acceptance and compliance. No comparison groups to determine if gains were made in parent education on safe sleep practice. Demographic characteristics not discussed.
Dufer & Godfrey, 2016	Level VI	None identified.	Quality improvement initiative. Parents provided education and given safe sleep handout. Pre-test, post-test, and 1 month follow tests were given to parents. Sample size of 40 parents. Likert scale used for parent questionnaire. Demographic information described. Question responses included in table format.	SPSS was used to conduct statistical analyses using frequencies and percentages. All parents reported using firm sleep surface and never had extra items in the crib. Significant improvement in pre-and post-test scores. Significant compliance with safe sleep at home at one month post discharge.	Small sample size, with 68% completing follow up questionnaire at one month. Study did not adequately describe staff training. The use of modeling safe sleep in the unit was not described.
Barsman, Dowling, Damato, & Czeck, 2015	Level VI	None identified	Qualitative study with prospective descriptive design. 96 completed questionnaires were received with 200 distributed. SIDS risk reduction questionnaire adapted from Grazel and colleagues with validity determined by neonatal nurse researchers, neonatal nurse practitioner, and members of the research committee.	SPSS used to examine data, but specific tests used are not described. Safe sleep practices and beliefs varied greatly between NICU and TCU in this study. TCU more consistently practiced and educated parents on safe sleep. Only half of nurses surveyed believe risk-reduction techniques decrease the incidence of SIDS.	One of the first studies on nursing beliefs and practices following 2011 AAP safe sleep recommendation update. Study does describe nurses' practice of safe sleep in the unit, but does not describe parent knowledge. Study compares two separate units, in a single center, which may not be typical for other facilities. Nurse education on safe sleep not adequately described.

Ostfeld, Schwartz-Soicher, Reichman, Teitler, & Hegyi, 2017	Level III	None identified.	<p>Quasi-Experimental design</p> <p>Statistical analysis of deaths attributed to SUID were compared among gestational age groups to determine the relationship between gestational age and risk of SUID.</p> <p>Sample of 7057122 births of which 4658 were categorized as SUID deaths.</p> <p>ICD-10 coding used.</p> <p>Other variables included: demographic, obstetric, behavior, prenatal care, and gestational age assessments.</p>	<p>Chi-square, mean, and logistic regression tests were used to compare death rates among gestational age groups.</p> <p>SUID is inversely related to gestational age.</p> <p>AAP recommendations which include safe sleep practice at earlier gestational age was not shown to decrease the risk of SUID.</p> <p>Prenatal smoking found to be strongly linked to risk of SUID.</p>	<p>Study provides valuable information about the risk of SUID and prematurity.</p> <p>Safe sleep practice by health care providers and parents is not described in this study.</p> <p>Results imply significance of education on safe sleep practices for caregivers of premature infants.</p>
Griffin, Heald, Davidson, & Kent, 2015	Level VI	None identified	<p>Prospective observational study</p> <p>Sample of 211 crib audits, 161 in special care nursery and 50 in general pediatric ward.</p> <p>Observed as compliant or non-compliant on 10 sleep rules developed from AAP safe sleep guidelines and Australian safe sleep programs.</p>	<p>Frequencies, Chi-square, and Mann-Whitney U tests were used to determine differences between general pediatric ward and special care nursery.</p> <p>Compliance with supine positioning very high.</p> <p>Other measures of safe sleep were in non-compliance more frequently in special care nursery.</p> <p>Removing objects from bed and use of head wear remained high in special care nursery</p>	<p>Study conducted in an Australian hospital.</p> <p>Single center design</p> <p>Sample much smaller for general pediatric ward but was accounted for with non-parametric tests.</p> <p>Suggests improvement recommendations for compliance with removal of items and transitioning away from head wear in special care nurseries, which may be beneficial for inclusion in project.</p>

McMullen, Fioravanti, Brown, & Carey, 2016	Level VI	Plan-Do-Study-Act framework used.	Quality improvement project. Education program implemented with pre-and post-tests and observation of safe sleep practice. Study included 658 participants of obstetric and pediatric nurses. Infant Sleep Positioning Questionnaire used with validity achieved with review from numerous pediatric nurses	SPSS program used. Descriptive statistics used for demographic information Chi-square and t-tests used for data analysis. Overall knowledge was less than expected, with little improvement noted in post-test scores. Observation component showed inconsistencies in nursing knowledge and practice. Greater than 90% compliance was achieved at 14 months following implementation.	Single center design, but large sample size observed. Process adequately described. Lengthy study period which shows the time required to achieve nearly full compliance with safe sleep guidelines. Unclear if journal is peer reviewed.
Naugler, M.R. & DiCarlo, K, 2018	Level I	None Identified	Literature review including 10 articles. Review process in 5 stages: problem identification, literature search, data evaluation, data analysis, and presentation. Exclusion criteria: anecdotal reports, review articles, articles under revision, poster presentations, dissertations, and research abstracts. Inclusion criteria: English language, premature births, and primary sources. Sample sizes ranged from 5 to 259 NICU parents and 86 to 658 NICU nurses.	For neonatal nurse compliance 3 categories were identified: barriers to practice, hospital policy, and nurse education. Nurses were knowledgeable on safe sleep, but compliance was not consistent. Developmental care practice was frequently stated to be a barrier to safe sleep practice. Fear of aspiration and infant comfort were also barriers. Having a hospital policy in place increased the likelihood of compliance. Most nurses received formal SIDS reduction and safe sleep education, but other factors influenced compliance. For parents 2 categories were identified: barriers to compliance and consistent education for parents. Parents had similar barriers to nurses with fear of choking and infant comfort found to be barriers to safe sleep practice. Parent education on SIDS and safe sleep is very inconsistent in the literature and may not be occurring at all in the NICU setting.	The review of the literature is well executed with the methods and analysis clearly described. Emerging themes from the literature clearly identified. The review provides strong evidence on problem identification with barriers to safe sleep practice in the NICU. Socioeconomic status influence is not included in this review.

Appendix B

Safe Sleep Promotion Logic Model



Appendix C

Safe Sleep in the NICU: How are we doing?



Nurses currently employed in the NICU, please complete a brief 10-minute survey on your practice of safe sleep in the NICU and parent education on safe sleep.

You could win one of two \$25 Target gift cards for your participation!!

Upon survey completion enter your name and phrase, as instructed at the end of the survey, for your chance to win a gift card. Place completed name and phrase sheet in the collection box in the staff lounge. Winner will be notified at survey closing on May 16, 2019.

Name:

Phrase:

Name:

Phrase:

Name:

Phrase:

Name:

Phrase:

Name:

Phrase:

Name:

Phrase:

Name:

Phrase:

Name:

Phrase:

Name:

Phrase:

Name:

Phrase:

Name:

Phrase:

Name:

Phrase:

Name:

Phrase:

Appendix D

Estimated Budget for Project

Activities/ Supplies	Immediate Cost- Survey Period	Follow Up Costs- Education Period
Non-productive time of staff	10 min/survey/participant Average \$30/h (\$0.5/minute) x 50 employees \$250.00	1-hour education session x \$30.00/h x 50 employees \$1500.00
Supervisor and Educator time	1-hour meeting x 4 x \$40.00/h average x 4 employees \$640	1-hour meeting x 6 x \$40.00/h x 4 employees \$960.00
Personal time	1h/day x 100 days \$1000.00	1h/day x 200 days \$2000.00
Flyers: ink and paper	50 flyers: \$0.10 per page, Ink \$55.00 \$60.00	50 flyers \$60.00
Gift card raffle	\$25.00 x 2 \$50.00	\$0
Total Cost	\$2000.00	\$4520.00

Appendix E

Survey Question Outline

Questions responses use the Likert scale

Barriers to safe sleep practice

- physician orders
 - How likely are physicians to place orders for positioning which conflicts with safe sleep i.e. supine sleep?
 - Never, not likely, sometimes, very likely, always
 - How often do adjunct therapists such as occupational/physical therapists recommended positioning or devices that conflict with safe sleep practice?
 - Never, almost never, sometimes, almost always, always
- Determining infant readiness for safe sleep practice over developmental care
 - How likely are current developmental care practices to conflict with safe sleep practice?
 - Never, not likely, sometimes, very likely, always
 - How often in practice are you conflicted/confused about placing an infant in strict safe sleep practice?
 - Never, almost never, sometimes, almost always, always
 - Do you agree that the current unit policy provides clear expectations of transitioning to safe sleep practice?
 - Disagree, somewhat disagree, neutral, somewhat agree, agree
- Nurses personal beliefs

- How much do you agree with the current recommendation of supine positioning during sleep for all infants?
 - Disagree, somewhat disagree, neutral, somewhat agree, agree
- How likely are you to recommend the use of home monitors to detect infant breathing patterns, such as the Owlet or Angel monitors?
 - Never, not likely, sometimes, very likely, always
- How likely are you to encourage having the infant sleep in the same room as the parents?
 - Never, not likely, sometimes, very likely, always
- How likely are you to encourage parents to co-sleep?
 - Never, not likely, sometimes, very likely, always
- Do you agree with the following statements: (Disagree, somewhat disagree, neutral, somewhat agree, agree)
 - Elevating the bed reduces reflux
 - Prone positioning reduces reflux
 - Developmental care devices are used too long in our unit
 - Developmental care devices are not used long enough in our unit
 - Pacifiers decrease the risk of SIDS
 - Sleep sacks reduce the risk of suffocation or strangulation during sleep
 - Bumper pads increase the risk of suffocation during sleep
 - Co-sleeping increases the risk of suffocation during sleep
 - Tobacco use in the home increases the risk of SIDS or crib death

- How likely are you to encourage parents to elevate the head of the bed at home for an infant with reflux?
 - Never, not likely, sometimes, very likely, always
- Parent or family culture which inhibits practice of safe sleep
 - How frequently do you encounter families with cultural practices that contradict safe sleep practice?
 - Never, almost never, sometimes, almost always, always
 - How likely are you to provide additional education written/verbal/other media to parents or families with conflicting cultural practices?
 - Never, not likely, sometimes, very likely, always
- When does safe sleep practice begin and how is it practiced currently
 - How often does safe sleep practice in your unit begin when the infant reaches a corrected age of 32 weeks gestation?
 - Never, almost never, sometimes, almost always, always
 - Do you continue to use positioners such as gel pillows, z-flo mattresses or positioners when the infant is in an open crib?
 - Never, almost never, sometimes, almost always, always
 - How likely are you to elevate the head of the bed when an infant is diagnosed or has suspected reflux?
 - Never, not likely, sometimes, very likely, always
 - How often do you place infants in a swing/rock-n-play/bouncer for upright positioning during infant sleep?
 - Never, almost never, sometimes, almost always, always

- How often does safe sleep practice begin with infant stabilization regardless of gestational age?
 - Never, almost never, sometimes, almost always, always
- How often does safe sleep practice begin within 2 weeks of discharge?
 - Never, almost never, sometimes, almost always, always
- How often does safe sleep practice begin within a few days of discharge?
 - Never, almost never, sometimes, almost always, always
- How often is safe sleep practice delayed in infants with chronic conditions?
 - Never, almost never, sometimes, almost always, always
- When does parent education begin
 - How likely are you to begin educating parents on safe sleep on admission to the NICU?
 - Never, not likely, sometimes, very likely, always
 - How likely are you to begin safe sleep education of parents when the infant becomes clinically stable?
 - Never, not likely, sometimes, very likely, always
 - How likely are you to begin safe sleep education within 2 weeks of discharge?
 - Never, almost never, sometimes, almost always, always
 - How likely are you to instruct parents on safe sleep practice on the day of discharge?
 - Never, almost never, sometimes, almost always, always
 - When are you most likely to provide parents with education on safe sleep practice?

- on admission, after the infant becomes stable/ feeder grower status, within 2 weeks of discharge, or the day of discharge
- Do nurses communicate with parents that developmental care positioning devices and practices are not appropriate for safe sleep at home?
 - How likely are you to communicate the need for developmental care devices on admission?
 - Never, not likely, sometimes, very likely, always
 - How likely are you to recommend the use of developmental care devices such as positioners, bean bag positioners such as frogs/zaky hands/ etc. at home?
 - Never, not likely, sometimes, very likely, always
 - How likely are you to recommend supine only positioning during sleep at home?
 - Never, not likely, sometimes, very likely, always
- Are written materials provided in language appropriate for parents/caregivers
 - When do you provide written materials to the parents with current AAP safe sleep recommendations?
 - Never, on admission, within 2 weeks of discharge, day of discharge?
- Is there a video or other media materials used to educate parents?
 - How often are other media materials such as videos, websites, classes assigned to parents prior to discharge
 - Never, almost never, sometimes, almost always, always
- Is there a consistent discharge education process used by nurses, ie a script, paper document nurses follow to give instructions?

- How likely are you to follow a unit provided script or document for safe sleep education?
 - Never, not likely, sometimes, very likely, always
- How do instructions change for infants with special needs or health conditions which may require different sleep positions?
 - How often do you encounter infants with health conditions which require a documented need for alternative positioning or use of devices at home which conflict with safe sleep practice i.e. prone positioning, elevated positioning, use of home apnea monitors or oxygen which increases strangulation risk?
 - Never, almost never, sometimes, almost always, always
 - How often are parents educated on the use of these devices and securing during sleep?
 - Never, almost never, sometimes, almost always, always

Table 1

Nurse Beliefs on AAP Recommendations and Unit Policy

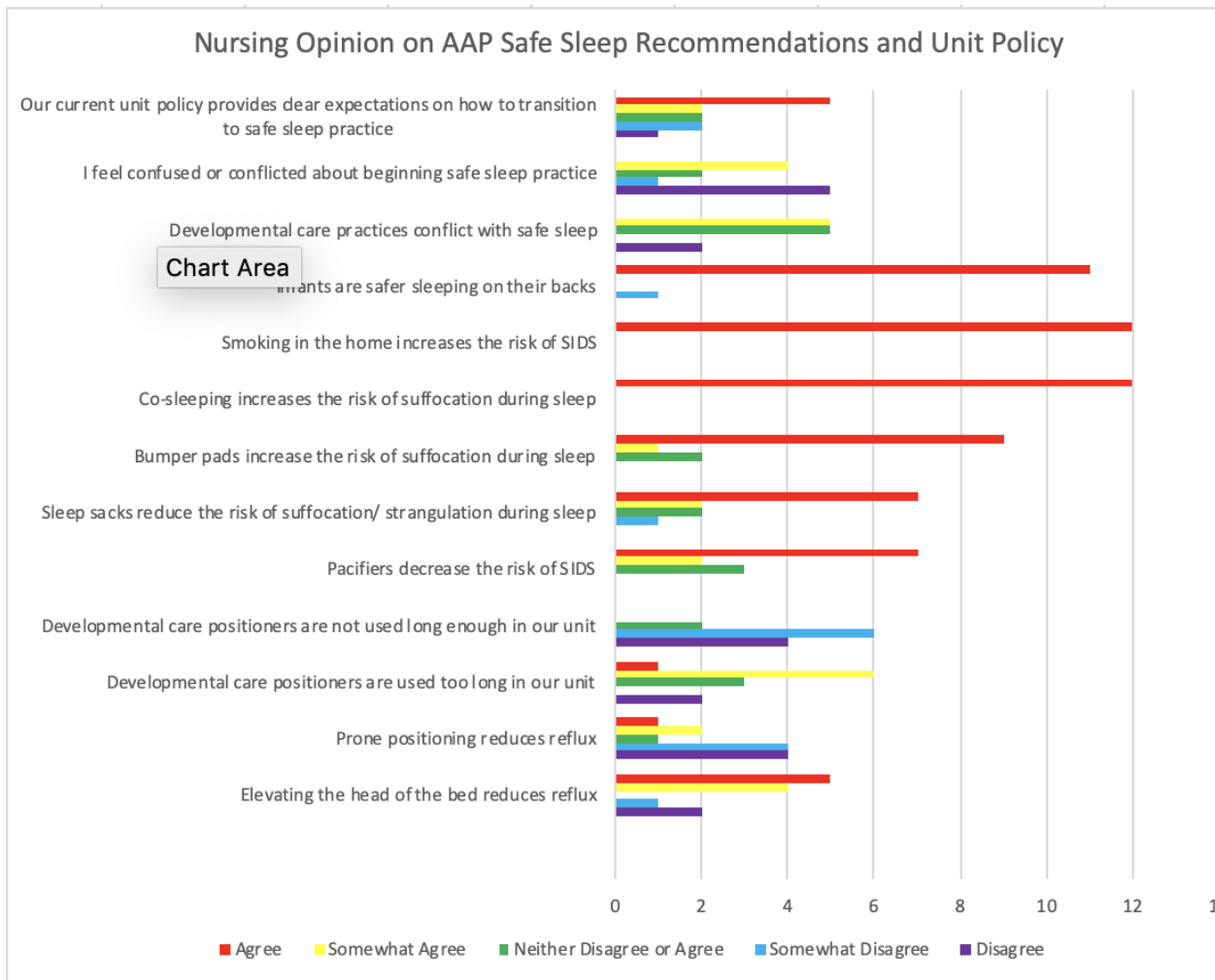


Table 2

Timing of Safe Sleep Practice and Formal Safe Sleep Education

Timing of Safe Sleep Practice and Formal Parent Education						
	Never	On Admission	When infant is stable	When infant transitions to open crib	Within 2 weeks of hospital discharge	Day of discharge
Formal education of parent/ caregiver on safe sleep	0	1	1	4	6	0
Parent/ Caregiver provided with written materials on safe sleep	0	1	0	0	7	4
Use of media such as videos, websites, or classes to provide safe sleep education	0	0	0	0	11	1
Safe sleep practice	0	0	3	4	3	0

Table 3

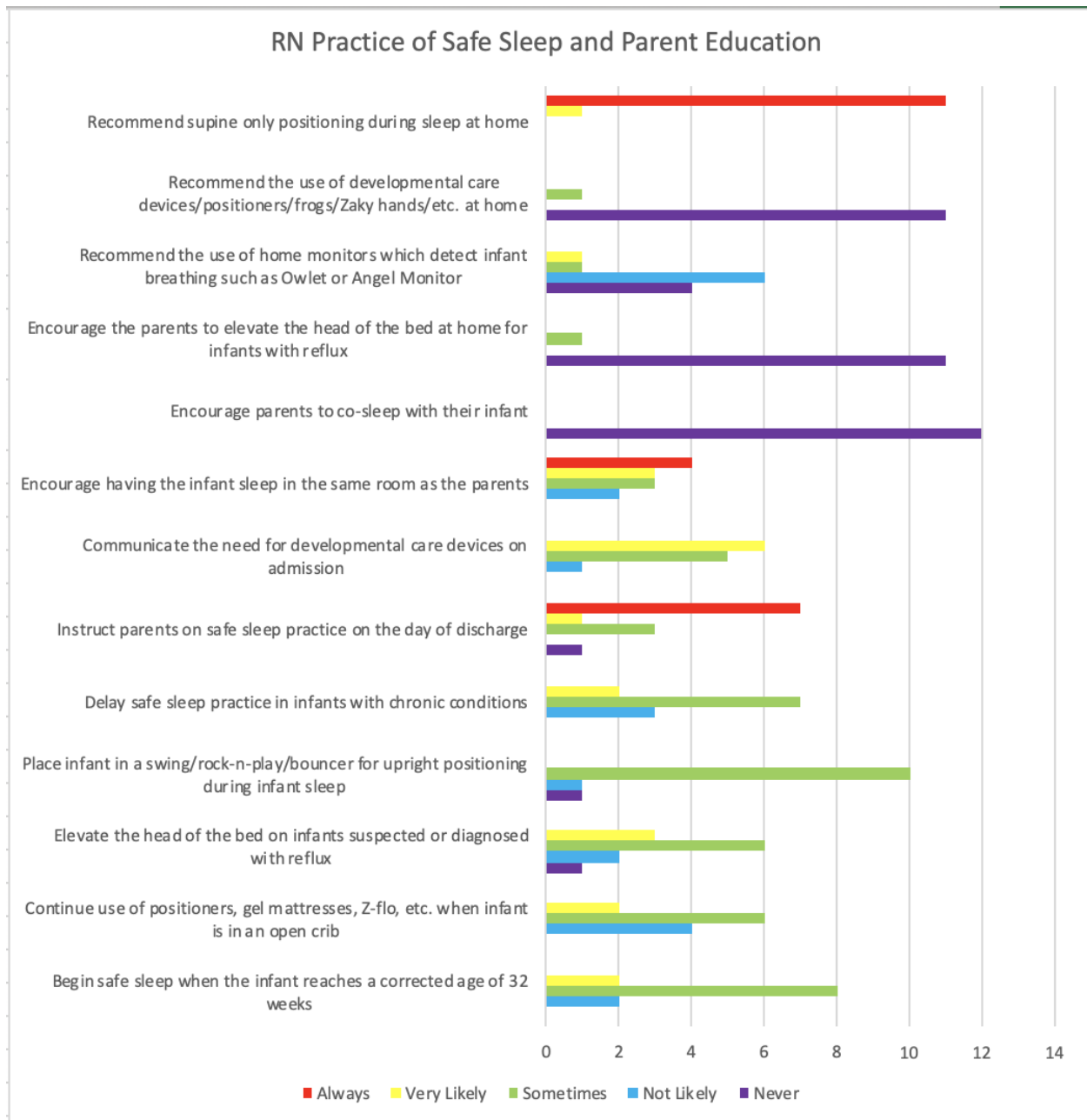
RN Practice of Safe Sleep and Parent Education

Table 4

Barriers to Practice

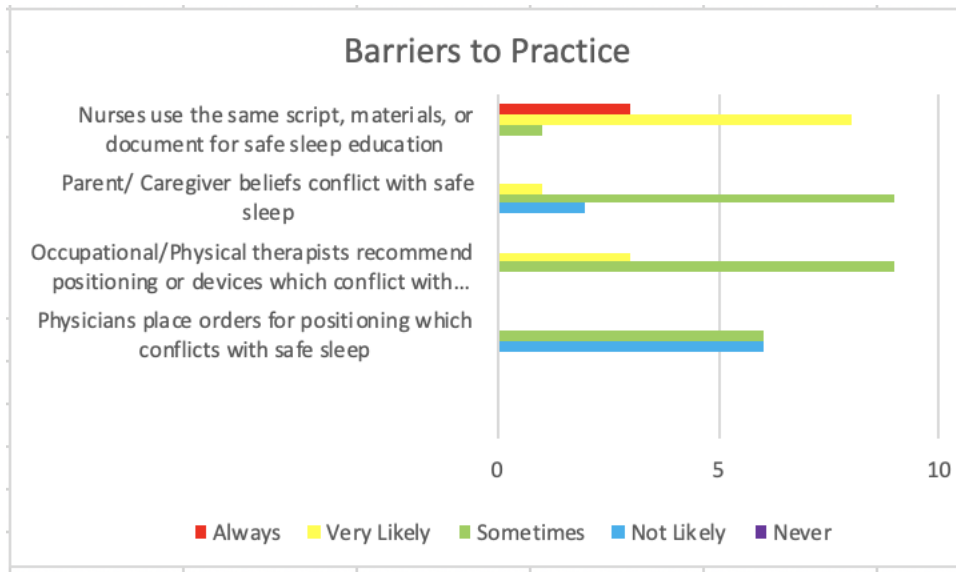


Table 5

Demographics

Demographics				
	less than 5 years	6-10 years	11-15 years	16 + years
Years of NICU Nursing Experience	3	1	3	5
How long have you been a nurse?	1	3	3	5

Table 6

Years of NICU Nursing Experience

