Sudden Infant Death Syndrome Prevention: A Model Program for NICUs

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Abstract

Health care providers' opinions can influence how parents place their infant to sleep. Neonatal nurses can improve how they teach and model safe infant sleep practices to parents. To increase neonatal nurses' knowledge, a sudden infant death syndrome (SIDS) prevention program was implemented. Program components included a computerized teaching tool, a crib card, sleep sacks, and discharge instructions. Initial program evaluation showed that 98 percent of infants slept supine and 93 percent slept in sleep sacks in open cribs. However, nurses continued to swaddle some infants with blankets to improve thermoregulation. To increase nursing compliance in modeling safe infant sleep practices, Halo SleepSack Swaddles were provided for nurses to use in place of a blanket to regulate infant temperature. Recent data show that 100 percent of infants in open cribs are now sleeping supine wearing a Halo Swaddle or a traditional Halo SleepSack. This model program can easily be replicated to enhance neonatal nurses' knowledge about SIDS prevention.

In 2004, about 4,600 U.S. infants died suddenly of no immediately obvious cause. Nearly half of these sudden unexplained infant deaths were attributed to sudden infant death syndrome (SIDS).[1] SIDS is "the sudden death of an infant less than one year of age that cannot be explained after a thorough investigation is conducted, including a complete autopsy, examination of the death scene, and review of the clinical history."[1]

The Back to Sleep campaign initiated by the American Academy of Pediatrics (AAP) in 1994 promoted supine sleep for the prevention of SIDS. The campaign was updated in 1996 to encourage supine sleep in premature as well as term infants. The most recent recommendations from the AAP, published in 2005, include:[2]

- supine-only position for sleeping
- a firm sleep surface
- elimination of soft objects from the crib
- elimination of infant exposure to smoking
- a prohibition against bed sharing (which is not considered safe)
- not overheating the infant
- no loose bedding in the crib

The recommendation to encourage supine sleep in healthy premature infants lacks specific guidelines for implementation. Neonatal nurses provide NICU infants with developmentally supportive strategies that include prone positioning. The lack of specific gestational age or physiologic criteria as to when to place the infant supine is confusing to neonatal nurses. Nurses are hesitant to change their practice if they are not fully educated regarding the validation for the modification.[3]

The NICU is a dynamic milieu with continuously evolving technology and guidelines for practice. With new research in the field of neonatology, nurses and physicians are constantly challenged to incorporate evidence-based practice into the care of premature or critically ill infants. Because the growing number of premature infants comprises a larger portion of the infants dying from SIDS, parents are often apprehensive when they take their infant home from the hospital.[4] Planning for a smooth discharge transition from the NICU to home is essential.

Any infant who requires special care in the NICU is considered part of the population vulnerable for SIDS. It is essential that neonatal nurses both teach and role-model

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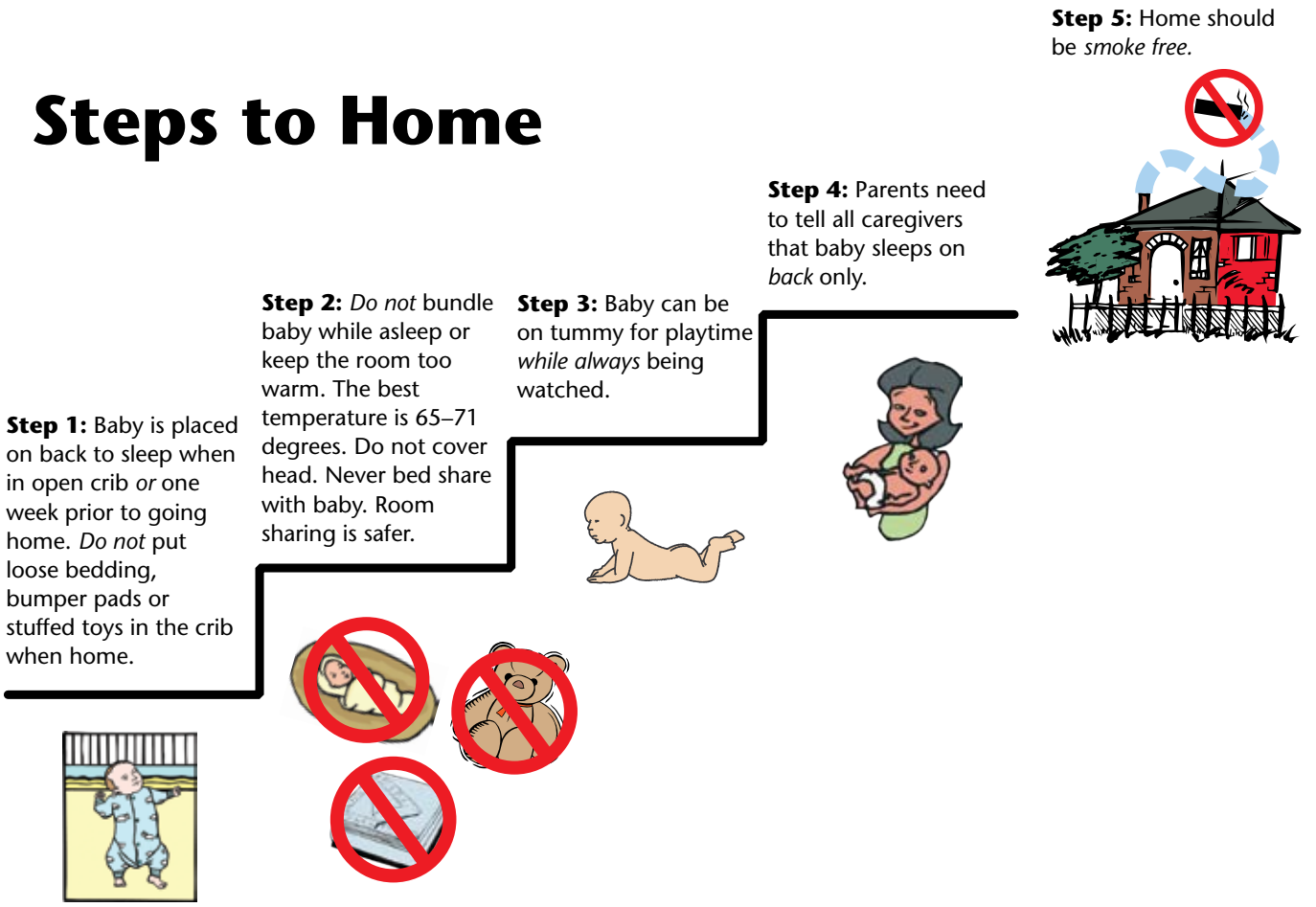
FIGURE 1 ■ SIDS prevention: A model program for NICUs.



recommended sleep practices to parents. The opinion of the health care provider, the sleep position the infant was placed in while in the NICU, and the parents' perception of what position the infant seems most comfortable sleeping in all strongly influence parent practices regarding infant sleep position.[5] Parents may lack knowledge about the relationship between the sleep position of their NICU graduate and the risks of SIDS. They may also be unaware of the dangers of bed sharing, a common practice, especially when the mother is breastfeeding the infant. In 2005, the AAP recommended that the infant should not sleep in the same bed with the parent, but rather in a proximate sleep environment.[2] To promote a safe sleep environment after discharge, nurses must be consistent both in providing SIDS risk-reduction strategies and in modeling safe sleep practices in the NICU.

An inquiry to our NICU from the American Association of SIDS Prevention Physicians (AASPP) regarding the knowledge and practice of neonatal nurses in relation to infant sleep position and SIDS prompted our investigation of the subject (personal communication, B. McIntyre, June 2, 2003). A neonatal nurse practitioner (NNP) in our NICU was asked to respond to the AASPP inquiry. Two surveys (phases 1 and 2) were developed to gather information. The surveys were distributed to NICUs statewide, as well as in two additional states, in 2003 and 2004.

The results of the surveys were published in 2006. The surveys revealed that 95 percent of NICU nurses identified a nonsupine sleep position as optimal for term and preterm infants. Neonatal nurses were surveyed on the question "When should preterm infants begin to sleep supine?" Responses were as follows:

- 29 percent: any time with proper positioning
- 25 percent: when they can maintain body temperature in an open crib
- 15 percent: at 34–36 weeks postmenstrual age (PMA)
- 13 percent: after 37 weeks PMA
- 11 percent: close to discharge
- 6 percent: when respiratory status is stable
- 1 percent: never

Only 52 percent of the neonatal nurses surveyed were teaching parents the correct position to place their infant to sleep at the time of the infant's discharge from the NICU.[6]

Importantly, these results demonstrate that the AAP recommendations were not consistently being incorporated into nursing practice. Organizational policy plays an important role in compliance. Without a clear understanding of the AAP guidelines and supporting hospital policy, nurses may convey conflicting messages that can confuse parents as to when, or even if, they should place their infant supine.[6]

THE SIDS NURSE EDUCATION CAMPAIGN

The results of the survey prompted the development of an educational campaign to increase nurses' knowledge about what they model and teach parents about infant sleep position at the time of discharge. Four advanced practice nurses created a comprehensive educational program that includes:

- a SIDS online teaching tool
- a laminated SIDS crib card
- sleep policy updates on positioning
- written discharge instructions for safe sleep and teaching record documentation
- use of sleep sacks when the infant moves to an open crib
- SIDS education as part of the orientation program for new NICU nurses

In January 2006, our educational campaign began with the mandate that every neonatal nurse complete the SIDS computer educational tool. Nurses provided feedback on the tool anonymously. When they had completed their online training, nurses attended a SIDS informational inservice education session that explained the use of the crib card, sleep sacks for infants in open cribs, policy changes, and reviewed the written discharge instructions. When educating nurses and convincing them to make practice changes, it is important to include information in orientation and annual inservice education programs.[3]

PROGRAM COMPONENTS

SIDS Educational Computer Program

As a result of our published survey on knowledge deficit and practices of NICU nurses, the research team created an educational teaching tool in 2004.[6] The goal of this computerized instruction, which takes an hour to complete, is to improve nurses' compliance with supine sleep guidelines for infants and, subsequently, to base parent teaching on current literature. The online tool presents theories of the etiology of SIDS and outlines modifiable and nonmodifiable risk factors for SIDS, with emphasis on the modifiable risk factors contained in the AAP guidelines. Nonmodifiable risk factors include race, prematurity, and low birth weight. A review of the literature as well as test questions that reinforce content are also included.

The teaching tool is currently being validated by the NNP who was the research team's primary investigator. When validation is complete, continuing education units will be available and can be accessed on the Upstate.edu website. Details for use of the tool are currently being established. Neonatal nurses across the country will be able to benefit from this easy-to-use computerized teaching tool.

Laminated SIDS Crib Card

A SIDS crib card based on the AAP's 2005 recommendations was developed. The laminated "Steps to Home" crib card (Figure 1) is designed for parents and grandparents to read while visiting the infant in the NICU. Nurses also review the card's content with parents. Placed on the incubator or open crib, the card stresses to caregivers the importance of the supine position for sleep and includes photographs of supine positioning, cautions against loose blankets or bumper pads in the crib, provides correct temperature ranges, and instructs caregivers to avoid infant overheating. It also stresses maintaining a smoke-free environment. The importance of providing infants with tummy time while they are awake and being observed is emphasized; tummy time promotes motor development and prevents positional plagiocephaly.[2,7] The parents are encouraged to take this laminated crib card home with them as an educational aid for all caregivers.

Hospital Sleep Policy

The hospital's infant sleep policy was revised to reflect the 2005 changes in the AAP recommendations. The policy was updated to eliminate placing the infant in any side-lying positioning in labor and delivery and the normal newborn nurseries. Under the updated policy, all healthy term infants are to be placed supine to sleep. Hospital policy now requires that, when stable, infants in the NICU also be placed supine to sleep, whether in an incubator or after transfer to an open crib. Sleep sacks are placed on infants who are able to maintain a normal body temperature.

Discharge Instructions and Teaching Record

Education for discharge begins long before the time of discharge. The nurses use the teaching record to document ongoing parent education. A written discharge instruction sheet for parents now contains information on supine positioning for sleep, tummy time, avoidance of loose bedding, and the prohibition against allowing the infant to sleep in the adult bed. Neonatal nurses review the instructions with parents.

Sleep Sacks

To eliminate the possibility of loose blankets covering the infant's face and to reduce the likelihood of overheating, the AAP recommends using sleep clothing with no other covering or using infant sleep sacks.[2] Properly designed sleep sacks keep the infant warm without the chance that the garment might cover the head. In our NICU, infants were initially placed in sleep sacks hand-sewn by a local church group that volunteered its services. The sleep sacks were sized appropriately, had openings for monitor wires, and

FIGURE 2 ■ Halo SleepSack swaddle.

Courtesy of Halo SleepSack

were placed on all infants when they were moved to an open crib. Parents could observe their infant in the supine position wearing a safe sleep garment, which reinforces SIDS prevention strategies.

SIDS Education for New Nurses

Each new nurse completes the SIDS computer teaching tool during the orientation program. New nurses are taught to use the crib card when discussing SIDS prevention with parents and for review when giving discharge instructions.

EVALUATION OF THE PROGRAM

The new NICU policy and educational components were built into practice by February 2006. Six months after education was completed, the clinical nurse specialist and the coordinator of the NICU undertook a performance initiative (PI) based on the plan-do-check system that the hospital uses to evaluate program implementation. At the time of the PI, 98 percent of NICU infants were sleeping supine in their open cribs, and 93 percent of those in open cribs were in sleep sacks. SIDS cards were visible on 88 percent of the open cribs or incubators for parents to read.

The environment that the infant sleeps in should be a comfortable temperature, and the infant should not feel hot to the touch.[2] Bundling the infant may cause him to overheat, which is a risk factor for SIDS. Although premature infants have trouble regulating temperature, we decided bundling them with blankets would be modeling unsafe sleeping practices.

Replacing blanket swaddling with a sleep sack was a change in practice that sparked some resistance from the NICU nurses. If thermoregulation is not maintained, the infant returns to the regulated environment of the incubator, thus delaying discharge. Nurses felt that some of the smaller infants were not dressed warmly enough in sleep sacks alone. Because infants are well monitored in the NICU, the nurses continued to wrap these infants in a light blanket in addition to placing them in a sleep sack. However, even though the blanket was kept at the nipple line, well away from the infant's shoulders (which is consistent with the 2005 AAP recommendations), and the infants were well monitored, use of a blanket with a sleep sack sent a confusing message to some parents. The practice was discontinued because it is not recommended.[8] Hats are used with discretion in the NICU, and parents are instructed to restrict their use at home.

Discovery of the Halo SleepSack Swaddle (Halo Innovations Inc., Minnetanka, Minnesota; www.halosleep.com) prompted its trial in the hope that it would improve thermoregulation in premature infants and prevent their return to the incubator. The Swaddle (Figure 2) has a wrap that encircles the sleep sack for extra warmth and comfort. The Halo Swaddle has been a success, improving nurse compliance with using only the Swaddle sleep sack in open cribs—and improving our modeling of the best sleep practices for parents.

In addition to the Swaddles, premature- and newborn-size Halo SleepSack wearable blankets (Figure 3) were purchased. They are currently used on all infants when they are transitioned to an open crib. Swaddles are predominantly used to maintain warmth for smaller infants. Larger infants who maintain their temperature are often placed in sleep sacks. SleepSack packaging lists infant weight and age to make it easy for parents to select the correct size.

During the early days of the program, sleep sacks, sewn by the church group, were given to parents when their infant was discharged. Giving parents a sleep sack to take home encourages continued use after discharge and discourages the use of blankets. Sleep sacks that are sewn by the church group continue to be distributed to the parents.

The Halo SleepSack wearable blankets are modeled after the item used in the original research conducted in the Netherlands. In that study, 74 infants were automatically placed supine by their parents simply because the zipper was in the front of the sleep sack. The study showed that the sleep sack kept infants from turning to the prone position before they were ready, moving down under a blanket, and overheating.[8]

First Candle is a nonprofit organization that promotes infant health and survival. The First Candle/SIDS Alliance supports the use of Halo SleepSacks for SIDS prevention and receives a portion of the proceeds from sales of SleepSacks for research. Information can be found at www.sidsalliance.org.

In July 2007, the clinical nurse specialist and the coordinator of the NICU completed another PI to continue the evaluation of the SIDS initiatives that were started in 2006. This PI found that 100 percent of NICU infants in open cribs were supine and had a SleepSack or Swaddle on. Some cribs lacked crib cards, possibly because we encourage parents to take the card home with them but lacked a formal process for having new cards made when the floor supply was exhausted. That oversight was rectified, and more cards were made, laminated, and applied to the equipment. All incubators and open cribs currently have crib cards on them. Crib cards are not placed on warmers. Parents are not able to take in information for discharge when their infant is not stable.

During the time the 2007 PI was conducted in the NICU, more than 70 percent of the infants were supine, regardless of whether they were in an open crib or an incubator. At times, 100 percent were found sleeping supine. Placing infants supine while in the hospital allows them to transition to the supine position before discharge. It also helps parents recognize sooner that their infant can tolerate the supine position for sleep.

In oxygen-dependent infants, an increase in oxygen demand may be seen while they are in the supine position compared with the prone position.[9] Initially, some nurses were reluctant to increase oxygen administration because of concerns of oxygen toxicity. Infants who were stable but needed oxygen via nasal cannula were placed supine. It was determined that the increase in oxygen is minimal and that the benefits of modeling supine sleeping and transitioning infants to the supine position likely outweigh the risks of the minimal increase in oxygen. More research needs to be completed in this area.

BED SHARING

The journey to create an environment that is safe for mothers and infants continued in 2006 when the newborn nursery/postpartum unit and Birth Place modeled the AAP 2005 recommendation for avoiding bed sharing. Hospital policy was modified to support the avoidance of bed-sharing risks. Currently, all infants sleep in their own bassinet and room-in with the mother, but are not allowed to sleep in the adult bed. In addition, twins and other multiples will sleep in separate cribs until further research is completed.

When a nurse observes the baby, the mother, or the mother-baby dyad sleeping in an unsafe situation, such as the infant in the bed with the mother or on a pillow, the nurse will move the child into a safe position and teach the parent the safe technique as soon as practical (for example, when the mother awakens, if she has fallen asleep). The nurses also have a script to follow when discussing safe sleep practices with mothers: "*If you feel that you are getting tired, please put the baby back in the crib, or put on your call light so that we can put the baby back in the crib for you. Falling asleep with your infant in your bed puts the baby in danger. The infant could fall on the floor or be smothered. This is a reminder for you also when you go home.*" In addition to the policy changes, a laminated card discussing the hazards of bed sharing has been placed on the bedside table in every room.

The postpartum unit has also purchased Halo SleepSack Swaddles, which mimic blanket swaddling, for term infants. The nurses have been modeling safe sleep practices for parents since the Swaddles were incorporated into practice. The Birth Place is currently looking into purchasing side cribs that attach to the adult bed so that mothers can place their infant in a safe sleep area right next to them after breastfeeding.[10] Nurses review the safe sleep brochure with parents in all our mother-infant units and give them a copy of the information at discharge.

FIGURE 3 ■ Halo SleepSack wearable blanket.

Courtesy of Halo SleepSack

CONCLUSION

This comprehensive SIDS program, which was incorporated into nursing practice on the maternal-child units, has made a measurable difference in nurses' compliance in modeling safe sleep practices and educating parents in the prevention of SIDS. We continue to be champions for supine positioning and enforce compliance with the AAP guidelines regarding bed sharing. However, more research is needed to clarify specific criteria for determining the right time to transition the premature infant from prone to supine positioning for sleep.

Modifying practice takes a team of dedicated individuals committed to the process of change. Pursuing evidence-based nursing research and publishing the results help improve what infant sleep practices nurses teach and model to parents of NICU infants. If neonatal units across the globe replicate this model program, they can better prepare neonatal nurses to teach and model safe sleep practices to parents.[6] Globally, we can improve care and drop the SIDS rate in this high-risk group of infants.

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