APTA
Academy of Pediatric Physical Therapy

FACT SHEET

The Physical Therapist's Role in Promoting Safe Sleep for Newborns: NICU to Home

INTRODUCTION

As a result of education efforts such as the 1994 National Institute of Child Health and Human Development (NICHD) "Back to Sleep" campaign, the number of infant deaths attributed to sudden infant death syndrome (SIDS) in the United States decreased by 50%.[1] Yet sleep-related infant deaths continue, and infants born preterm face a 2-3 times higher risk of sleep-related death.[2,3] Subsequent guidance from the American Academy of Pediatrics (AAP)[4,5] emphasizes the importance of "Safe Sleep" practices for infants born preterm. The sleep disturbances,[6] gastroesophageal reflux,[7] and skull deformation[8] that many infants born preterm experience can prompt some caregivers to choose unsafe sleep practices. This fact sheet highlights the need for appropriate parent education and modeling of Safe Sleep, in preparation for the infant's transition from the Neonatal Intensive Care Unit (NICU) to home. Physical therapists (PTs) are ideally situated to implement and reinforce Safe Sleep education with parents throughout the NICU stay and in the natural environment. The PT, as part of a multidisciplinary team, may assist in drafting Safe Sleep policies for the NICU, provide ongoing staff education and surveillance, and provide education on Safe Sleep guidelines to families.

AAP SAFE SLEEP GUIDELINES

The AAP recommends that all infants be placed to sleep in a manner that reduces the risk of SIDS. The guidelines can be summarized as "ABC: Alone, Back, Crib" and include:

- Removing soft bedding, bumpers, or other objects from the sleep space. (A pacifier is permitted).
- Placing the infant in the supine position.
- Using a firm sleep surface that is separate from the parent's sleep surface, but in the same room.

Please refer to the AAP 2016 guideline[4] for a complete list of recommendations
https://publications.aap.org/pediatrics/article/138/5/e20162940/60296/SIDS-and-Other-Sleep-Related-Infant-Deaths

In 2008, the AAP Committee on Fetus and Newborn published guidelines for hospital discharge of high-risk neonates that recommend, "Hospitalized preterm infants should be kept predominantly in the supine position, at least from the postmenstrual age of 32 weeks onward, so that they become acclimated to supine sleeping before discharge."[5] In 2021, the same task force recommended that NICUs develop protocols for implementing this recommendation so that infants and their families are adequately prepared to continue these Safe Sleep practices after being discharged from the hospital.[9] These protocols ensure that infants who may require developmentally-supportive positioning for neuroprotection in prematurity or during a critical illness are able to successfully transition to Safe Sleep practices. Readiness for Safe Sleep may take into account the infant's postmenstrual age, weight, respiratory symptoms, other medical conditions, respiratory support, and other medical treatments. PTs need to understand, support, and comply with Safe Sleep guidelines and abide by institutional Safe Sleep policies. PTs should support Safe Sleep practices in their institutions through involvement in writing or revising policies, conducting staff education on implementing Safe Sleep policies, and educating families of infants throughout the NICU stay.

PHYSICAL THERAPISTS AND NICU SAFE SLEEP POLICIES

Among NICU providers and staff, neonatal PTs have a unique perspective on the secondary impairments that can result from prolonged time in the supine position. These include:

- cranial deformity (deformational dolichocephaly, brachycephaly, or plagiocephaly)
- cervical lordosis
- asymmetric head posture
- shoulder elevation and retraction
- hip abduction/external rotation.[10]

Considerations for prioritizing Safe Sleep while reducing the risk of secondary impairments include providing a gradual transition to Safe Sleep for some infants and making supplemental recommendations for infants who are appropriate for Safe Sleep (see TABLE 1).

TABLE 1: Safe Sleep Policy Considerations to Reduce Risk of Secondary Impairments

Concept	Examples	
Transitional period of decreasing time in side-lying and prone positions and increasing time in the supine position with some positioning devices	Support midline head position for an infant on CPAP using blanket rolls or a commercial device to reduce risk of cranial deformity	Provide reinforced boundaries around an infant positioned supine using blanket rolls or commercial devices to support the infant's physiological stability
Supplemental recommendations for positioning/handling once the infant has transitioned to Safe Sleep	Vary head positioning among right rotation, left rotation, and midline	Provide regular time in the prone position while awake
	Use wearable blankets or good swaddling technique to support hip development	Provide regular time being held by family or staff
Medical exceptions to Safe Sleep at >32 weeks PMA must be defined and agreed to by the neonatology team	Examples include intubation, respiratory distress, weight <1500 grams, vascular access lines that limit positioning, neonatal drug withdrawal, and incubator for thermoregulation	Congenital anomalies or post-operative conditions requiring prone positioning (e.g. myelomeningocele, Pierre-Robin sequence)
Abbreviations: CPAP: continuous positive airway pressure. PMA: postmenstrual age		

Well-written policies use clear terminology and logical processes to minimize ambiguity. Uncertainty among staff who are interpreting written policy can contribute to noncompliance.[11] Terms such as "medically stable," "respiratory support," "mature thermoregulation," and "adequate weight gain" must be clearly defined when used in decision-making. Developing an algorithm to illustrate the decision-making process may minimize requests for exceptions for individual infants with prolonged lengths of stay or unusual medical needs.

PHYSICAL THERAPISTS AND SAFE SLEEP EDUCATION IN THE NICU

PTs can improve Safe Sleep practices in NICUs through ongoing involvement in the education of staff and families. Naugler and DiCarlo[12] stated that although nurses respect written policies and report learning best from online education, additional follow-up education is important for compliance. Strategies for staff education (see TABLE 2) include increasing general knowledge, responding to concerns, and individualized consultation.

TABLE 2: Safe Sleep Education for NICU Staff

Concept	Examples	
Serve as knowledge brokers for new or revised policies	Written education	Question/answer sessions
	Bedside conversations (1-on-1 teaching)	Hands-on practice of techniques e.g. swaddling
Address specific concerns and barriers to supine sleep through evidence and advice[9]	Gastroesophageal reflux[13]	Desire for more developmentally-supportive positioning
	Skull deformation	Irritability/poor sleep
Teach strategies to avoid secondary impairments associated with supine sleeping	Varying head positions (right rotation, left rotation, and midline)[14]	Proper hip/lower extremity alignment for swaddling[15]
	If positional preference of head rotation, increase positioning to non-preferred side	Proper use of wearable blankets[15]
Assist staff to implement specific strategies with individual infants	Generic bedside signage (e.g. "I am in Safe Sleep Mode" or "I am in Therapeutic Positioning Mode")	Individualized bedside signage for specific impairments (e.g. head shape)
	Consultation during PT visits	Developmental rounds

With families, teaching Safe Sleep should begin the first-time positioning is discussed. Topics (see TABLE 3) include anticipatory guidance, general education, frequent review of safe sleep guidelines, and individualized strategies for decreasing the risk of secondary impairments in their infant.

TABLE 3: Safe Sleep Education for Families

During early teaching encounters, explain that:	Developmental positioning is an exception to Safe Sleep, made to support physiological stability in the medically fragile infant and protect the developing brain.
	Positioners will no longer be used once the infant meets certain criteria indicating readiness to transition to safe sleep.
Throughout the NICU stay, demonstrate and discuss:	The meaning of "Alone, Back, Crib" and other Safe Sleep recommendations for home
	How to implement awake time in prone without increasing stress or energy expenditure
	How and why to provide a variety of age-appropriate holding, movement, and positioning experiences throughout the day
As the infant nears discharge from the NICU, provide individualized, hands-on education on:	How to bring the infant's sleeping environment into compliance with Safe Sleep guidelines
	Proper use of wearable blankets and swaddle blankets

	Handling techniques to minimize startle when laying infant in the supine position to sleep
	How to implement awake time in prone, respecting daily routines
	How to use a variety of play positions and carrying/handling techniques during daily routines, and safe sleep for naps
	Specific strategies to address the infant's impairments (e.g. positional skull deformity, positional head-turning preference, GER, poor tolerance to prone positioning, strong Moro or startle reflex, ongoing medical needs) while practicing Safe Sleep

TRANSITION TO HOME

PTs working in early intervention in natural environments should be aware that the therapeutic positioning practices seen in NICU policy may present the appearance of conflict with Safe Sleep. Parents may also receive conflicting advice from friends or family.[16] Unsafe practices commonly seen in home environments include:

- propping infants in U-shaped pillows during sleep[17]
- positioning infants prone during supervised naps
- positioning infants in car seats, swings, or other devices during sleep
- modifying the crib mattress or sleep surface through head-of-bed elevation, head positioners, pillows, or blanket rolls
- falling asleep while holding an infant
- bed sharing.

PTs who encounter these practices have a duty to inform families that they present a risk of sleep-related death. PTs should continue to provide education on best practices for positioning during both sleep and awake/playtimes, and support families who are caring for infants that do not sleep soundly.

CONCLUSIONS

The initial success of declining death rates seen after the era of the Back to Sleep campaign has plateaued, and loss of life continues. Significantly higher risks for preterm and low birth weight infants persist.[18] PTs in the NICU or Early Intervention work closely with infants at increased risk of sleep-related death and, through family-centered care, are partners with families. As such, PTs are situated not just to support the infant's motor development, but also to observe caregiving routines and sleep environments in the NICU and at home. PTs have a unique opportunity to educate, model, and continually re-assess compliance with safe sleep practices.

REFERENCES

1. Moon RY, Task Force on Sudden Infant Death Syndrome. SIDS and other sleep-related infant deaths: evidence base for 2016 updated recommendations for a safe infant sleeping environment. *Pediatrics*. 2016;138(5):e20162940. doi:10.1542/peds.2016-2940
2. Bass JL, Gartley T, Lyczkowski DA, Kleinman R. Trends in the incidence of sudden unexpected infant death in the newborn: 1995-2014. *J Pediatr*. 2018;196:104-108. doi:10.1016/j.jpeds.2017.12.045
3. Ostfeld BM, Schwartz-Soicher O, Reichman NE, Teitler JO, Hegyi T. Prematurity and sudden unexpected infant deaths in the United States. *Pediatrics*. 2017;140(1):e20163334. doi:10.1542/peds.2016-3334
4. AAP Task Force on Sudden Infant Death Syndrome. SIDS and other sleep-related infant deaths: Updated 2016 recommendations for a safe infant sleeping environment. *Pediatrics.* 2016;138(5):e20162938

5. AAP Committee on Fetus and Newborn. Hospital discharge of the high-risk neonate. *Pediatrics.* 2008;122:1119-1126. Reaffirmed November 2018.
6. Bennet L, Walker DW, Horne RSC. Waking up too early - the consequences of preterm birth on sleep development. *J Physiol.* 2018;596(23):5687-5708. doi: 10.1113/JP274950
7. Eichenwald EC; Committee on Fetus and Newborn. Diagnosis and management of gastroesophageal reflux in preterm infants. *Pediatrics*. 2018;142(1):e20181061. doi: 10.1542/peds.2018-1061. Epub 2018 Jun 18. PMID: 29915158.
8. Ifflaender S, Rüdiger M, Konstantelos D, Lange U, Burkhardt W. Individual course of cranial symmetry and proportion in preterm infants up to 6 months of corrected age. *Early Hum Dev.* 2014;90(9):511-5. doi: 10.1016/j.earlhumdev.2014.03.008.
9. Goodstein MH, Stewart DL, Keels EL, et al; AAP Committee on Fetus and Newborn, Task Force on Sudden Infant Death Syndrome. Transition to a Safe Home Sleep Environment for the NICU Patient. *Pediatrics.* 2021;148(1)e:2021052046.
10. Sweeney JK, Gutierrez T. Musculoskeletal implications of preterm infant positioning in the NICU. *J Perinat Neonatal Nurs.* 2002;16(1):58-70.
11. Patton C, Stiltner D, Wright KB, Kautz DD. Do nurses provide a safe sleep environment for infants in the hospital setting? An integrative review. *Adv Neonatal Care*. 2015;15(1):8-22. doi:10.1097/ANC.0000000000000145
12. Naugler MR, DiCarlo K. Barriers to and interventions that increase nurses' and parents' compliance with safe sleep recommendations for preterm infants. *Nurs Womens Health.* 2018;22(1):24-39.
13. Lightdale JR, Gremse DA; Section on Gastroenterology, Hepatology, and Nutrition. Gastroesophageal reflux: management guidance for the pediatrician. *Pediatrics*. 2013;131(5):e1684-e1695. doi:10.1542/peds.2013-0421
14. The ABCs of safe sleep. Pathways.org. Retrieved from: https://pathways.org/abcs-of-safe-sleep/. Accessed August 15, 2021.
15. Swaddling: IDHI position statement. International Hip Dysplasia Institute. Updated February 14, 2019. Retrieved from: https://hipdysplasia.org/swaddling-statement/. Accessed August 15, 2021.
16. Zundo K, Richards EA, Ahmed AH, Codington JA. Factors associated with parental compliance with supine infant sleep: an integrative review. *Pediatr Nurs*. 2017;43(2):83-91.
17. Cottengim C, Parks SE, Erck Lambert AB, et al. U-Shaped pillows and sleep-related infant deaths, United States, 2004-2015. *Matern Child Health J*. 2020;24(2):222-228. doi:10.1007/s10995-019-02847-9
18. Oyen N, Markestad T, Skaerven R, et al. Combined effects of sleeping position and prenatal risk factors in sudden infant death syndrome: the Nordic Epidemiological SIDS Study. *Pediatrics*. 1997;100(4):613-621. doi:10.1542/peds.100.4.613

ADDITIONAL RESOURCES

US Department of Health and Human Services. Safe to Sleep. https://safetosleep.nichd.nih.gov/
Centers for Disease Control. Sudden Unexpected Infant Death and Sudden Infant Death Syndrome. https://www.cdc.gov/sids/Parents-Caregivers.htm
March of Dimes. Safe Sleep for your Baby. https://www.marchofdimes.org/baby/safe-sleep-for-your-baby.aspx
American Academy of Pediatrics. Safe Sleep. https://www.aap.org/en/patient-care/safe-sleep/
American Physical Therapy Association Academy of Pediatrics. Positioning the Medically Fragile Preterm Infant in the Neonatal Intensive Care Unit. https://pediatricapta.org/fact-sheets/

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