

The Role of the EMS Provider in Promoting Safe Infant Sleep to Reduce Infant Mortality

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EMS providers play a critical role in responding to calls about a sudden and unexpected death of a seemingly healthy infant. The immediate situation calls for multiple simultaneous actions, each in itself daunting. Attempts are launched to revive the infant. Distraught parents and other family members, including young siblings, seek information and support. The conditions of the death scene must be observed and noted. And, all of this must be achieved with the utmost concentration and professionalism even though the death of an infant evokes the most intense personal feelings and emotions by first responders. No one participating in such an event leaves the case without wondering what could have been done to prevent this. This article will address this question and describe the unique additional role the EMT can play in providing families with preventive education.

Ultimately, the majority of sudden unexpected infant deaths (SUID) will likely be classified as Sudden Infant Death Syndrome (SIDS). Despite a decline by over half in the rate of SIDS since the onset of the Back to Sleep campaign over 20 years ago, it continues to be the leading cause of post neonatal infant mortality in the United States and thus an important public health issue. SIDS is defined as the sudden death of an infant less than one year of age that remains unexplained even after the performance of a complete autopsy, an assessment of the death scene, and a review of the clinical history. In essence, it is a diagnosis given when all knowable causes of death have been examined and dismissed, leaving no explanation for the death.¹ Thus, these parents will never have a specific answer to the question all parents ask following loss: why? And, the absence of a defined cause adds uniquely to the enormous burden of grief the family must endure. However, although a specific cause is absent in SIDS deaths, we do know a great deal about the risk factors that contribute to the occurrence of these deaths and what it takes to eliminate them. The risks have been identified through evidence-based medical studies, and they form the basis of the safe infant sleep guidelines established by the American Academy of Pediatrics in 1992 and most recently revised in 2011.^{2,3} When the guidelines are followed, the incidence of SIDS and other sleep-related infant deaths, such as accidental suffocation, declines. In short, they work.

Since the onset of such recommendations as placing the infant to sleep on his/her back, the national rate of SIDS went from 1.2 deaths per thousand live births in 1992 to 0.51 deaths per thousand live births in 2010. Translated into cases, compliance with the safe sleep guidelines has resulted in a national decline of SIDS deaths from 4,891 in 1992 to 2,058 in 2010, the most recent year with finalized infant mortality data from the Centers for Disease Control. Thirty-eight of the SIDS cases in 2010 occurred in New Jersey whose SIDS rate of 0.36 per thousand live births falls well below the national rate of 0.51.

Risk reduction and preventive education is one of the mandates of the SIDS Center of New Jersey (SCNJ), a statewide program now in its 26th year. Its other missions are to provide bereavement support to families whose infants have died suddenly and unexpectedly, to study these deaths, and to provide risk reduction education. The program is funded by a grant from the New Jersey Department of Health to Rutgers Robert Wood Johnson Medical School and a grant from the CJ Foundation for SIDS to Hackensack University Medical Center. The SCNJ provides education on safe infant sleep to medical, educational, social service, child care and similar institutions as well as the general public and thus reaches physicians, nurses, social service agents, community workers, home visiting agents, child care providers and others who work with families. In 2013, over 3,500 individuals attended educational sessions. These programs enable hospitals, clinics and other systems to educate new parents as well as grandparents and others who will help care for an infant about the most effective ways to eliminate the risks related to SIDS and other sleep-related infant deaths.

Yet, while many caregivers now know the AAP guidelines, they are not always followed. What can help? Reassurance and repetition of the message matter. So too does watching other caregivers do the same. Research also has demonstrated that an important contribution to compliance is made when safe sleep advice is reinforced by a home visitor who is respected and trusted and perceived as medically knowledgeable.⁴ This description precisely fits the EMS provider.

During calls to the home, for reasons other than a sudden unexpected infant death, the EMS provider may be in a position to observe if an infant under 12 months of age is cared for there and what the sleep conditions of that infant may be. Is he bed sharing with a sleeping adult? That would elevate the risk of SIDS. So too would pillows, quilts, bumpers and other soft objects scattered in the crib. Is the infant sleeping prone (belly down)? The prone position is not advised, except in rare instances that can be identified by the infant's pediatrician. Side sleeping is also to be avoided. The AAP advises that supine (back) placement is the safest sleep position for starting off all sleeps in the first twelve months of life. Of course, a baby who is old enough to roll over from belly to back and back to belly may then move himself to a different position, and that is okay. But, if a six week old infant is observed prone, it is likely that he was placed that way to begin with, and that is not okay. Is anything covering the infant's face? Is anyone smoking in the presence of the infant or pregnant mother? These conditions also pose danger. These are but some of the observations that can inspire a respectful conversation and an offering of relevant safe sleep material. It should also be noted that many of the risk factors for SIDS are also risk factors for accidental suffocation another category of death under the umbrella of sudden unexpected infant deaths.

In a pediatrician's office, a discussion between the physician and the caregiver about safe sleep is abstract. No observation is actually made. But in the home, the real circumstances of sleep can inspire a more practical discussion. Should the nature of the call to the home limit the time for observation and discussion, the EMS provider may still be able to offer some printed materials on safe infant sleep provided by the National Institute of Child Health and Human Behavior (www.nichd.nih.gov/sids) and the SIDS Center of New Jersey (www.rwjms.rutgers.edu/sids). All of these materials reflect the most recent evidence-based guidelines of the American Academy of Pediatrics.

In the remainder of this article, we will describe the current theory as to why the conditions of the infant's sleep environment elevate the risk of a sudden unexpected infant death. We will then review the risk factors and risk-reducing guidelines defined by the American Academy of Pediatrics. We will discuss some of the barriers to compliance and how to address them. Finally, we will provide several resources where additional information can be obtained.

Current theory

Although the AAP guidelines promote the application of safe infant sleep practices to reduce the risk of SIDS and other sleep-related causes of death, such as accidental suffocation, the role that risk factors play in each specific cause of death is different. With accidental suffocation, risk factors such as loose or soft bedding may be deemed causal if a death scene investigation determines that an infant was trapped in and unable to escape from an oxygen-depriving and thus fatal situation. An example would be an infant who is trapped under an adult in a shared bed. In contrast, in SIDS, although sleep-related risk factors are highly likely to be present,⁵ the infant is not entrapped. Instead, according to current theory, these risk factors may contribute to the death by exacerbating an inborn vulnerability found in the brainstem of some infants⁶ Infants with this vulnerability have diminished capacity to be aroused by and escape from an hypoxic challenge by moving their heads away from the proximate soft bedding and adjusting cardiac and respiratory functions. Both the capacity to arouse to an hypoxic challenge and to turn the head are within the ability of normal infants to accomplish. An example would be an infant sleeping with his face next to a pillow. Unless he is trapped or has the physiological vulnerability just noted, he should be able to reach a lighter state of sleep and then lift and turn his head from the pillow. Safe infant sleep recommendations simply remove the environmental threats that can contribute to either cause of death.

The combination of a critical period of time, namely the first twelve months of life, an underlying vulnerability that renders the infant insensitive to hypoxic challenges, and an environmental factor that exacerbates the vulnerability, such as sleeping face down in soft bedding, is called the triple risk model.^{2,6} The prevailing theory with respect to the nature of the vulnerability is that there is a deficit in the presence of the neurotransmitter serotonin in the arcuate nucleus of the brainstem of some infants. It is a deficiency that is not yet detectable in life. Thus, protection of the infant is achieved by removing the environmental challenge. The safe sleep guidelines therefore address conditions that may compromise breathing, such as sleeping face down in soft bedding or conditions that may further reduce an infant's capacity to become aroused, such as overheating or smoke exposure.

The AAP Guidelines to Reduce the Risk for SIDS and Other Sleep-Related Deaths

The following recommendations are intended for infants in the first 12 months of life.^{2,3} For any questions, please call the SIDS Center of New Jersey (1-800-545-7437).

- Babies sleep safest on their backs. All sleep times count no matter whether they are naps or nighttime sleep. With rare exception, this advice applies to both full term and premature infants. The AAP advises families to check with their healthcare provider to confirm that this guideline is applicable to their baby. At some point, usually around five or six months of age, babies begin to turn over. When they can do so both from belly to back and back to belly, they can be left in the position they roll into. However, the caregiver should continue to start off the infant's sleep with the back to sleep position.
- Use a firm mattress in a safety-approved crib, bassinet or portable crib for sleep times. You can get information about these products from the Consumer Product Safety Commission (1-800-638-2772 or www.cpsc.gov). The mattress should fit with no gaps. The mattress should be covered with a tightly fitted sheet and nothing else.
- Do not place soft objects such as pillows, quilts, blankets, bumpers, sheepskins, loose bedding or stuffed animals in the crib or under the baby.

- Babies should not sleep in an adult bed, on a couch or on a chair alone with you or with anyone else, not even a twin. Share your room with your baby but not your bed. If you bring your baby into bed to breastfeed or comfort, put your baby back in his separate crib, bassinet or portable crib in your room when you are finished and ready to resume your sleep. Room sharing is good.



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- Don't let a baby get overheated. Babies are fine wearing no more than one layer more than an adult would wear in that setting. If the room is quite cool, instead of a blanket use clothing items such as a one-piece sleeper or "wearable" blanket. Take notice of sweating and damp hair.
- Never cover a baby's face.
- Avoid using products that claim to reduce the risk of SIDS and other sleep-related infant deaths such as wedges or position holders as these have not been tested and in some cases have been associated with unintended adverse consequences.
- No one should smoke near the baby or around a pregnant woman.
- Encourage breastfeeding. Breastfeeding reduces the risk of SIDS.
- At sleep time offer an intact, clean, dry pacifier without any string attached to it. It should not be forced, and if it falls out during sleep, it does not have to be replaced. Wait one month before using a pacifier if the infant breastfeeds.
- Keep up with immunizations and regular health checkups
- Provide ample "tummy time" when baby is awake and an adult is watching. This activity helps baby's muscles develop and helps prevent flat spots on the back of a baby's head. Avoiding excessive time in carriers, infant seats and bouncers can also reduce the risk of flat spots.
- Discuss these safe sleep guidelines with the baby's health care provider.

- Be sure to let everyone who takes care of the baby know about these safe sleep messages. Unaccustomed belly down sleep in a baby who is used to back to sleep carries an even greater risk of SIDS.

Addressing Potential Barriers to Compliance

Grandparents did things differently.

Back to sleep is the opposite of the position that was recommended when today's grandparents were raising their children. The advice given then was that belly down sleep helped prevent choking. Therefore, those who raised their infants differently may need to discuss their concerns and receive reassurance. Because we now know better, we can do better. Extensive research has demonstrated that the back to sleep position is safe and that babies may actually clear their fluids more effectively on their backs. In short, back to sleep reduces the risk of SIDS without raising other risks. As with all recommendations, the AAP urges families to discuss this recommendation with the infant's healthcare provider as there are rare exceptions.

What about a flat spot on the back of my infant's head?

The AAP advises that ample use of tummy time when the infant is awake and being watched by an adult and avoidance of extended times in carriers, bouncers and similar devices help reduce this risk. In addition, the AAP advises that when babies are put to sleep on their backs, for several days they can be placed in the crib so that their right arm is toward the area of the room with the most activity or interest. For the next few nights, they can be placed so that the left arm is toward that direction. In that way, as the baby turns his head toward the activity, the time he spends with his head turned to any one side will be comparable.

Some families cannot afford a crib.

In some families, the baby is sleeping in an adult bed, not by choice, but because of a lack of resources for the purchase of a crib. A home visitor is in a position to learn about this and help the family reach out to their healthcare provider, clinic or local Division of Child Protection and Permanency office.

Summary

SIDS and other sleep-related infant deaths continue to be an important public health problem. The EMS provider occupies a position of trust and respect, and, as a home visitor, is in a position to observe infant sleep practices and offer the standard-of-care guidelines of the American Academy of Pediatrics regarding safe infant sleep. Health information exchanges in home settings by trusted professionals have a positive impact on health practices and therefore on infant mortality.

Safe Infant Sleep Materials

The NICHD and the SIDS Center of New Jersey are two examples of institutions that provide safe infant sleep material, and their websites were referenced above. The SIDS Center of New Jersey flyer is reprinted in Appendix A and can be sent to you electronically upon request (1-800-545-7437 or scnj@rwjms.rutgers.edu).

References

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Appendix A

SAFE SLEEP FOR YOUR

REDUCE THE RISK OF SUDDEN INFANT DEATH SYNDROME AND OTHER SLEEP-RELATED DEATHS SUCH AS ACCIDENTAL SUFFOCATION AND STRANGULATION IN BED

DON'T USE SOFT OBJECTS, PILLOWS, QUILTS, BUMPERS, LOOSE BEDDING OR STUFFED ANIMALS IN THE CRIB OR UNDER THE BABY

SHARE YOUR ROOM WITH YOUR BABY



PLACE YOUR BABY TO SLEEP ON HIS OR HER BACK

BABIES SHOULD NOT SLEEP IN AN ADULT BED, ON A COUCH, OR ON A CHAIR ALONE, WITH YOU, OR WITH ANYONE ELSE

USE SLEEP CLOTHING SUCH AS A ONE-PIECE SLEEPER INSTEAD OF A BLANKET

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- DO NOT LET ANYONE SMOKE NEAR THE BABY.
- USE A FIRM MATTRESS IN A SAFETY APPROVED** CRIB, BASSINET OR PORTABLE CRIB. COVER THE MATTRESS WITH A FITTED SHEET AND NOTHING ELSE.
- SHARE YOUR ROOM WITH YOUR BABY BUT NOT YOUR BED. IF YOU BRING YOUR BABY INTO YOUR BED TO BREASTFEED, PUT YOUR BABY BACK IN HIS SEPARATE CRIB, BASSINET OR PORTABLE CRIB IN YOUR ROOM WHEN YOU ARE FINISHED.
- OFFER A CLEAN, DRY PACIFIER AT SLEEP TIME. IF YOU BREASTFEED WAIT UNTIL ONE MONTH OF AGE BEFORE OFFERING A PACIFIER.
- DO NOT LET YOUR BABY OVERHEAT DURING SLEEP.
- BE SURE THAT NOTHING COVERS THE BABY'S FACE.
- DISCUSS THESE GUIDELINES WITH YOUR BABY'S HEALTH CARE PROVIDER.

BREASTFEEDING REDUCES THE RISK OF SIDS

KEEPING UP WITH IMMUNIZATIONS REDUCES THE RISK OF SIDS



Do not forget "Tummy Time" when the baby is awake and being watched. Tummy time helps your baby's muscles get stronger and helps prevent flat spots on the head. Avoiding excessive time in carriers and bouncers can also help. For more information access our website: www.rwjms.rutgers.edu/sids

QUESTIONS? PLEASE CONTACT
The SIDS Center of New Jersey
 800-545-7437
SCNJ@rwjms.rutgers.edu

This material is for infants from birth to 12 months and is based on the guidelines of the American Academy of Pediatrics Task Force on Sudden Infant Death Syndrome: SIDS and Other Sleep-Related Infant Deaths: Expansion of the Recommendations for a Safe Infant Sleep Environment, published in 2011 in *Pediatrics*. Safe infant sleep can reduce the risk of Sudden Infant Death Syndrome and other sleep-related deaths such as accidental suffocation and strangulation in bed. This is intended for full term and preterm infants, with rare exception. Discuss these guidelines with baby's healthcare provider. **For questions about crib safety regulations: www.cpsc.gov or 1-800-638-2772 (Prepared 7/13; re-formatted 6/14).